Honeywell

# 4600rp, 4600g/4600r, 4800i

Commercial/Retail/Industrial Area Imager

## User's Guide

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## *Product Agency Compliance*

## *USA*

### *FCC Part 15 Subpart B Class A*

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed

and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Use only shielded data cables with this system.

Caution: Any changes or modifications made to this equipment not expressly approved by Honeywell may void the FCC authorization to operate this equipment.

### UL Statement

UL listed: UL60950-1.

## Canada

### Industry Canada ICES-003

This Class A digital apparatus complies with Canadian ICES-003. Operation is subject to the following conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

### Conformité à la règlementation canadienne

Cet appareil numérique de la Classe A est conforme à la norme NMB-003 du Canada. Son fonctionnement est assujetti aux conditions suivantes :

1. Cet appareil ne doit pas causer de brouillage préjudiciable.
2. Cet appareil doit pouvoir accepter tout brouillage reçu, y compris le brouillage pouvant causer un fonctionnement indésirable.

### cUL Statement

cUL listed: CSA C22.2 No.60950-1-03.

## Europe

The CE marking indicates compliance to 2004/108/EC EMC Directive with Standards EN55022 CLASS A, EN55024, EN61000-3-2, EN61000-3-3. In addition, complies to 2006/95/EC Low Voltage Directive, when shipped with recommended power supply.

For further information please contact:

Honeywell Imaging & Mobility Europe BV
Nijverheidsweg 9-13
5627 BT Eindhoven
The Netherlands

Honeywell International Inc. shall not be liable for use of our product with equipment (i.e., power supplies, personal computers, etc.) that is not CE marked and does not comply with the Low Voltage Directive.

### Waste Electrical and Electronic Equipment Information

Honeywell complies with Directive 2002/96/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 January 2003 on waste electrical and electronic equipment (WEEE).

This product has required the extraction and use of natural resources for its production. It may contain hazardous substances that could impact health and the environment, if not properly disposed.

In order to avoid the dissemination of those substances in our environment and to diminish the pressure on the natural resources, we encourage you to use the appropriate take-back systems for product disposal. Those systems will reuse or recycle most of the materials of the product you are disposing in a sound way.

The crossed out wheeled bin symbol informs you that the product should not be disposed of along with municipal waste and invites you to use the appropriate separate take-back systems for product disposal.

If you need more information on the collection, reuse, and recycling systems, please contact your local or regional waste administration.

You may also contact your supplier for more information on the environmental performances of this product.

## Germany

GS marked to EN60950-1:2001.

## Australia/NZ

### C-Tick Statement

Conforms to AS/NZS 3548.

## South Korea (4600r only)

MIC Class A EMC requirements.

## Mexico

Conforms to NOM-019.

## International

### Eye Safety Statement: LED

This device has been tested in accordance with IEC60825-1: 1993+A1+A2 LED safety, and has been certified to be within the limits of a Class 1 LED device.

### CB Scheme

Certified to IEC60950-1 (2001) First Edition.

## Patents

Please refer to the product packaging for patent information.

## Solids and Water Protection

The 4600g/4600r has a rating of IP41, immunity of foreign particles and dripping water.

The 4800i has a rating of IP54, immunity of windblown dust penetration and splashing water.

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# Getting Started

## About This Manual

This User's Guide provides installation and programming instructions for the 4000 Series imagers. Product specifications, dimensions, warranty, and customer support information are also included.

Honeywell barcode imagers are factory programmed for the most common terminal and communications settings. If you need to change these settings, programming is accomplished by scanning the barcodes in this guide.

An asterisk (*) next to an option indicates the default setting.

## Unpacking the Imager

After you open the shipping carton, take the following steps:

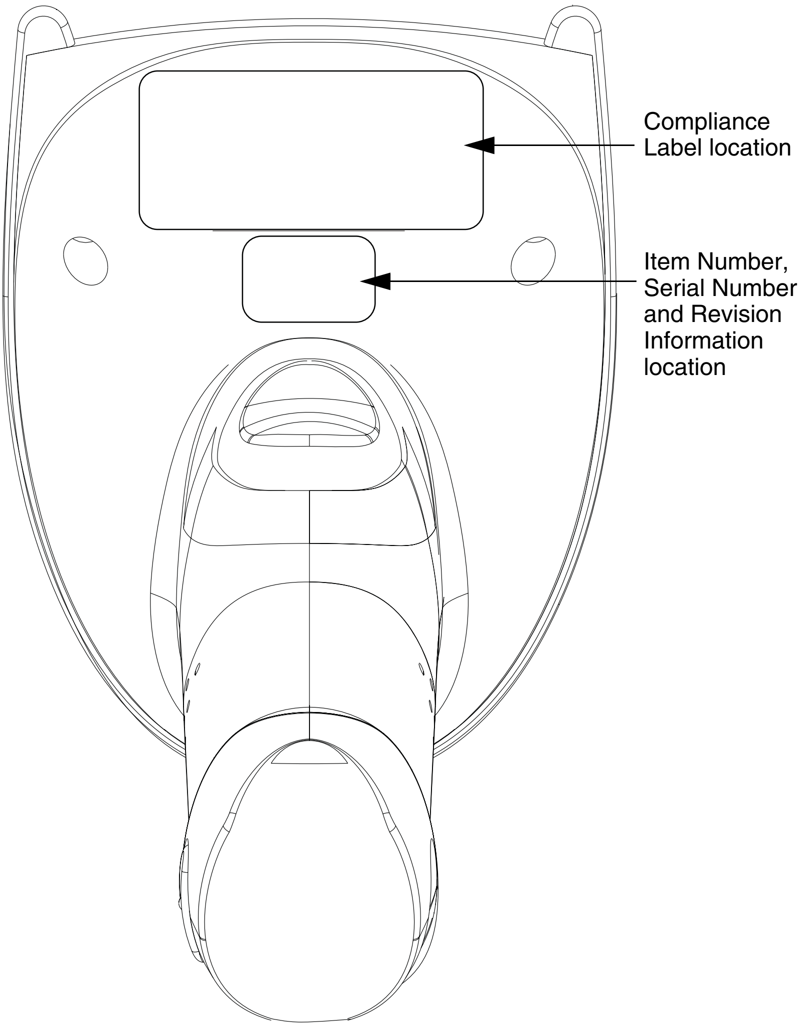
- Check for damage during shipment. Report damage immediately to the carrier who delivered the carton.
- Make sure the items in the carton match your order.
- Save the shipping container for later storage or shipping.

## Imager Models

The chart below lists the interfaces that can be used with your imager. Refer to Chapter 6 for programming information regarding secondary interfaces.

| **Models** | **Primary** | **Secondary** |
| --- | --- | --- |
| 4600gXX03XX<br>4800iXX03XX | True RS-232 | True RS-232 |
| 4600gXX05XX<br>4800iXX05XX | Keyboard wedge, TTL level 232, TTL level 232 serial wedge, IBM 4683, wand emulation, USB keyboard, USB HID, USB retail (IBM SurePOS), USB COM port emulation | Wand Emulation, TTL level 232 |
| 4600rXX05XX<br>4600rpXX05XX | Keyboard wedge, TTL level 232, TTL level 232 serial wedge, IBM 4683, USB keyboard, USB HID, USB retail (IBM SurePOS), USB COM port emulation | TTL level 232 |

# *Imager Identification*

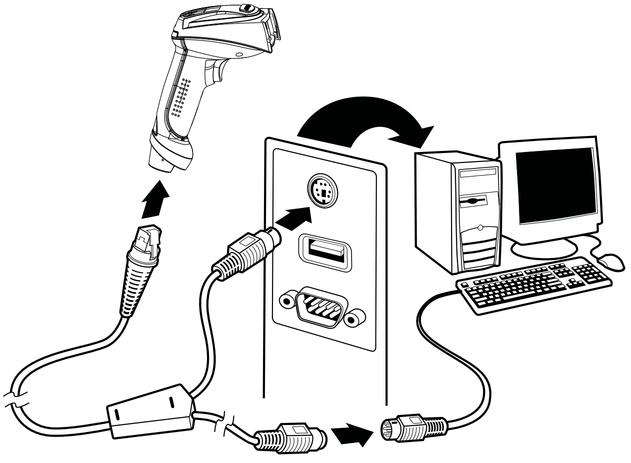


# Connecting the Imager with Keyboard Wedge

*Note: See "Imager Models" on page 1-2 to determine which interfaces apply to your imager.*

An imager can be connected between the keyboard and PC as a “keyboard wedge,” plugged into the serial port, or connected to a portable data terminal in wand emulation or non decoded output mode. The following is an example of a keyboard wedge connection:

1. Turn off power to the terminal/computer.
2. Disconnect the keyboard cable from the back of the terminal/computer.
3. Connect the appropriate interface cable to the imager and to the terminal/computer.



4. Turn the terminal/computer power back on. The imager beeps.
5. Program the imager for a keyboard wedge interface using the Plug and Play barcodes beginning on page 1-8.
6. Verify the imager operation by scanning a barcode from the Sample Symbols in the back of this manual. The imager beeps once.

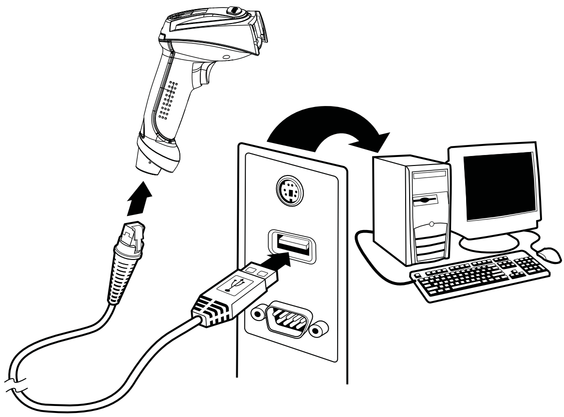
Your imager is factory programmed for a keyboard wedge interface to an IBM PC AT with a USA keyboard. If this is your interface and you do not need to modify the settings, skip to Chapter 3 - Output.

# Connecting the Imager with USB

*Note: See "Imager Models" on page 1-2 to determine which interfaces apply to your imager.*

An imager can be connected to the USB port of a computer.

1. Connect the appropriate interface cable to the imager first, then to the computer.



2. Program the imager for a USB interface using the Plug and Play barcodes beginning on page 1-9.
3. The imager beeps.
4. Verify the imager operation by scanning a barcode from the Sample Symbols in the back of this manual.

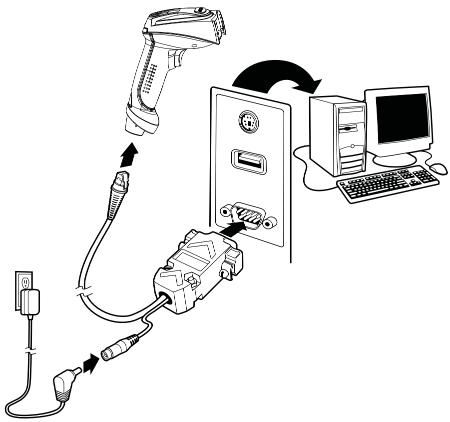
For additional USB programming and technical information, refer to "USB Application Note," available at www.honeywell.com/aidc.

## *Connecting the Imager with RS-232 Serial Port*

*Note: See "Imager Models" on page 1-2 to determine which interfaces apply to your imager.*

1. Turn off power to the terminal/computer.
2. Connect the appropriate interface cable to the imager.

*Note: For the imager to work properly, you must have the correct cable for your type of terminal/computer.*



3. Plug the serial connector into the serial port on your computer. Tighten the two screws to secure the connector to the port.
4. Plug the power supply into the cable.
5. Once the imager has been fully connected, power up the computer.
6. Program the imager for an RS-232 Serial Port interface using the Plug and Play barcode on page 1-11.

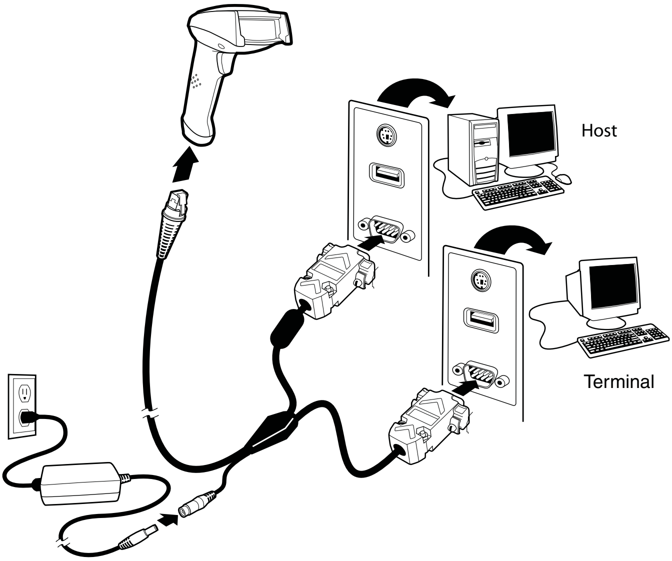
## *Connecting the Imager with RS-232 Wedge*

*Note: See "Imager Models" on page 1-2 to determine which interfaces apply to your imager.*

Your imager uses True and TTL signal levels to wedge into an RS-232 serial network. Use only serial wedge cables to prevent damage to the imager. Refer to RS-232 Baud Rate on page 2-10 to set the baud rate and communications protocol.

1. Turn off power to the computer.
2. Disconnect the existing serial cable from the computer.
3. Connect the appropriate interface cable to the imager.

*Note: For the imager to work properly, you must have the correct cable for your type of computer.*




4. Plug the serial connector into the serial port on your computer. Tighten the two screws to secure the connector to the port.
5. Plug the other serial connector into the host connection and tighten the two screws.
6. Plug the power pack cable into the receptor on the imager cable.
7. Plug the power pack into a power source.
8. Once the imager has been fully connected, power up the computer.
9. To set up the serial wedge terminal ID, use the serial terminal ID 050 and follow the instructions on page 2-1.
10. Program the port for data transmission using the barcodes on page 1-12.

## Programming the Interface - Plug and Play

Plug and Play barcodes provide instant imager set up for commonly used interfaces.

*Note: After you scan one of the codes, power cycle the host terminal to have the interface in effect.*

*Note: See "Imager Models" on page 1-2 to determine which interfaces apply to your imager.*

## Keyboard Wedge Connection

If you want your system programmed for an IBM PC AT and compatibles keyboard wedge interface with a USA keyboard, scan the barcode below. Keyboard wedge is the default interface.

IBM PC AT and Compatibles
with CR suffix

### Laptop Direct Connect

For most laptops, scanning the ***Laptop Direct Connect*** barcode allows operation of the imager in parallel with the integral keyboard. The following Laptop Direct Connect barcode also programs a carriage return (CR) suffix, and turns on Emulate External Keyboard (page 2-7).

Laptop Direct Connect
with CR suffix

# USB Connection

## IBM SurePos

Scan one of the following "Plug and Play" codes to program the imager for IBM SurePos (USB handheld imager) or IBM SurePos (USB Tabletop imager).

*Note: After scanning one of these codes, you must power cycle the cash register.*

IBM SurePos
(USB Handheld Imager)
Interface

IBM SurePos
(USB Tabletop Imager)
Interface

Each barcode above also programs the following suffixes for each symbology:

| Symbology | Suffix |
|---|---|
| EAN-8 | 0C |
| EAN-13 | 16 |
| UPC-A | 0D |
| UPC-E | 0A |
| Code 39 | 00 0A 0B |
| Interleaved 2 of 5 | 00 0D 0B |
| Code 128 | 00 18 0B |

### *USB PC or Macintosh® Keyboard*

Scan one of the following codes to program the imager for USB PC Keyboard or USB Macintosh Keyboard. Scanning these codes adds a CR and selects the terminal ID (USB PC Keyboard - 124, USB Macintosh Keyboard - 125).

USB Keyboard (PC)

USB Keyboard (Mac)

USB Japanese Keyboard (PC)

### *USB HID*

Scan the following code to program the imager for USB HID barcode imagers. Scanning this code changes the terminal ID to 131.

USB HID Barcode Imager

### *USB COM Port Emulation*

Scan the following code to program the imager to emulate a regular RS-232-based COM port. If you are using a Microsoft® Windows® PC, you will need to download a driver from the Honeywell website (www.honeywell.com/aidc). The driver will use the next available COM port number. Apple® Macintosh computers recognize the imager as a USB CDC class device and automatically use a class driver. Scanning the code below changes the terminal ID to 130.

USB COM Port Emulation

*Note: No extra configuration (e.g., baud rate) is necessary.*

### *CTS/RTS Emulation*

On

* Off

### *ACK/NAK Mode*

On

* Off

## *RS-232 Serial Port Connection*

All communication parameters between the imager and terminal must match for correct data transfer through the serial port using RS-232 protocol. Scanning the RS-232 interface barcode programs the imager for an RS-232 interface at 38,400 baud, parity–none, 8 data bits, 1 stop bit, and adds a suffix of a CR LF.

RS-232 Interface

## *Serial Wedge Data Transmission Port*

Using the following barcodes, set the port to which you want the scanned data to transmit. Port 1 corresponds to P1 on the output cable and Port 2 corresponds to P2 on the output cable. Choosing Both sends scanned data to P1 and P2. *Default = P1.*

***** P1

P2

Both P1 and P2

## *IBM 4683 Ports 5B, 9B, and 17 Connection*

*Note: See "Imager Models" on page 1-2 to determine which interfaces apply to your imager.*

Scan one of the following “Plug and Play” codes to program the imager for IBM 4683 Port 5B, 9B, or 17.

*Note: After scanning one of these codes, you must power cycle the cash register.*

IBM 4683 Port 5B Interface

IBM 4683 Port 9B HHBCR-1 Interface

IBM 4683 Port 17 Interface

Each of the previous barcodes also programs the following suffixes for each symbology:

| Symbology | Suffix |
|---|---|
| EAN-8 | 0C |
| EAN-13 | 16 |
| UPC-A | 0D |
| UPC-E | 0A |
| Code 39 | 00 0A 0B |
| Interleaved 2 of 5 | 00 0D 0B |
| Code 128 | 00 0A 0B |

.

IBM 4683 Port 9B HHBCR-2 Interface

The IBM 4683 Port 9B HHBCR-2 Interface barcode also programs the following suffixes for each symbology:

| Symbology | Suffix |
|---|---|
| EAN-8 | 0C |
| EAN-13 | 16 |
| UPC-A | 0D |
| UPC-E | 0A |
| Code 39 | 00 0A 0B |
| Interleaved 2 of 5 | 00 0D 0B |
| Code 128 | 00 18 0B |

## *Wand Emulation Connection*

*Note: See "Imager Models" on page 1-2 to determine which interfaces apply to your imager.*

In Wand Emulation mode, the imager decodes the barcode then sends data in the same format as a wand imager. The Code 39 Format converts all symbologies to Code 39.

The Same Code Format transmits UPC, EAN, Code 128, Codabar, and Interleaved 2 of 5 without any changes, but converts all other symbologies to Code 39. 2D symbologies are converted to Code 128.

The ***Wand Emulation Plug & Play (Code 39 Format)*** barcode below sets the terminal ID to 61. The ***Wand Emulation Plug & Play Same Code*** barcode sets the terminal ID to 64. These barcodes also set the Transmission Rate to

25 inches per second, Output Polarity to black high, and Idle State to high. (If you want to change the terminal ID *only*, without changing any other imager settings, please refer to Wand Emulation Connection on page 2-12.)

Wand Emulation
Plug & Play
(Code 39 Format)

Wand Emulation
Plug & Play
Same Code

## *Menu Barcode Security Settings*

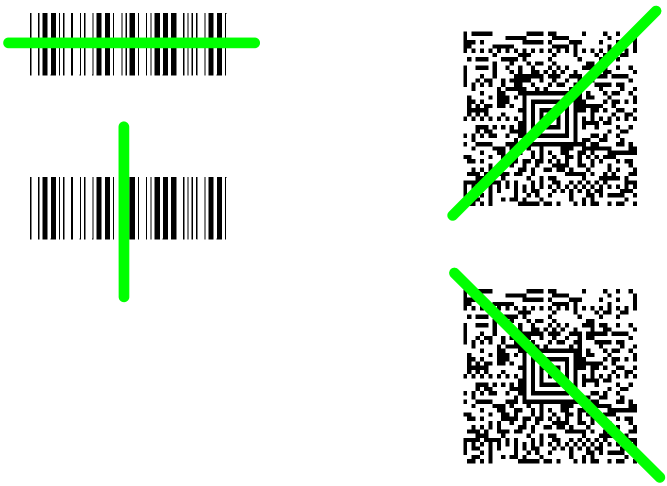
Honeywell 2D imagers are programmed by scanning menu barcodes or by sending serial commands to the imager. If you want to restrict the ability to scan menu codes, you can use the Menu Barcode Security settings. Please contact the nearest technical support office (see Technical Assistance on page 15-1) for further information.

# Reading Techniques

The imager has a view finder that projects a bright red or green aiming beam that corresponds to the imager's horizontal field of view. The aiming beam should be centered over the barcode, but it can be positioned in any direction for a good read.

Linear barcode

2D Matrix symbol



The aiming beam is smaller when the imager is closer to the code and larger when it is farther from the code. Symbologies with smaller bars or elements (mil size) should be read closer to the unit. Symbologies with larger bars or elements (mil size) should be read farther from the unit. To read single or multiple symbols (on a page or on an object), hold the imager at an appropriate distance from the target, pull the trigger, and center the aiming beam on the symbol. If the code being scanned is highly reflective (e.g., laminated), it may be necessary to tilt the code $\pm 5°$ to prevent unwanted reflection.

# 2

# Terminal Interfaces

## Terminal ID

If your interface is not covered by a Plug and Play barcode from Chapter 1, then refer to Supported Terminals on page 2-2 through page 2-3, and locate the Terminal ID number for your PC. Scan the **Terminal ID** barcode below, then scan the numeric barcode(s) from the Programming Chart inside the back cover of this manual to program the imager for your terminal ID. Scan **Save** to save your selection.

For example, an IBM AT terminal has a Terminal ID of 003. You would scan the **Terminal ID** barcode, then **0**, **0**, **3** from the Programming Chart inside the back cover of this manual, then **Save**. If you make an error while scanning the digits (before scanning Save), scan the **Discard** code on the Programming Chart, scan the **Terminal ID** barcode, scan the digits, and the **Save** code again.

Terminal ID

Save

*Note: After scanning one of these codes, you must power cycle your computer.*

## *Supported Terminals*

*Note: See "Imager Models" on page 1-2 to determine which interfaces apply to your imager.*

| **Terminal** | **Model(s)** | **Terminal ID** |
|---|---|---|
| DDC | 3496, 3497, 122 key | 005 |
| DDC | 3496, 3497, 102 key | 071 |
| DEC | VT510, 520, 525 (PC style) | 084 |
| DEC | VT510, 520, 525 (DEC style LK411) | 104 |
| Esprit | 200, 400 | 005 |
| Heath Zenith | PC, AT | 003 |
| Heath Zenith | | 090 |
| HP | Vectra | 003 |
| HP | Vectra | 023 |
| IBM | XT | 001 |
| IBM | PS/2 25, 30, 77DX2 | 002 |
| IBM | AT, PS/2 30–286, 50, 55SX, 60, 70, 70–061, 70–121, 80 | 003 * |
| IBM 102 key | 3151, 3161, 3162, 3163, 3191, 3192, 3194, 3196, 3197, 3471, 3472, 3476, 3477 | 006 |
| IBM 122 key | 3191, 3192, 3471, 3472 | 007 |
| IBM 122 key | 3196, 3197, 3476, 3477, 3486, 3482, 3488 | 008 |
| IBM 122 key | 3180 | 024 |
| IBM 122 key | 3180 data entry keyboard | 114 |
| IBM DOS/V 106 key | PC & Workstation | 102 |
| IBM SurePOS | USB Handheld Imager | 128* |
| IBM SurePOS | USB Tabletop Imager | 129* |
| IBM Thinkpad | 360 CSE, 340, 750 | 097 |
| IBM Thinkpad | | 106 |
| IBM Thinkpad | 365, 755CV | 003 |
| I/O 122 key | 2676D, 2677C, 2677D | 008 |
| ITT | 9271 | 007 |
| Lee Data | IIS | 007 |
| NEC | 98XX Series | 103 |
| Olivetti | M19, M200 | 001 |
| Olivetti | M240, M250, M290, M380, P500 | 003 |
| RS-232 True | | 000** |
| RS-232 TTL | | 000 |

## *Supported Terminals*

*Note: See "Imager Models" on page 1-2 to determine which interfaces apply to your imager.*

| **Terminal** | **Model(s)** | **Terminal ID** |
|---|---|---|
| Serial Wedge | | 050 |
| Silicon Graphics | Indy, Indigoll | 005 |
| Telex 88 key | 078, 078A, 79, 80, 191, 196, 1191,1192, 1471, 1472, 1476, 1477, 1483 | 025 |
| Telex 88 key | Data Entry Keyboard | 112 |
| Telex 102 key | 078, 078A, 79, 80, 191, 196, 1191,1192, 1471, 1472, 1476, 1477, 1483 | 045 |
| Telex 122 key | 078, 078A, 79, 80, 191, 196, 1191,1192, 1471, 1472, 1476, 1477, 1482, 1483 | 046 |
| USB COM Port Emulation | | 130 |
| USB Japanese Keyboard (PC) | | 134 |
| USB PC Keyboard | | 124* |
| USB Mac Keyboard | | 125* |
| USB HID POS | | 131* |
| Wand Emulation (Code 39 Format) | | 061 |
| Wand Emulation (Same Code Format) | | 064 |

* Default for 4600g/4600r/4600rp/4800iXX 05XX models. It is best to use the Plug and Play barcodes, beginning on page 1-9, to program these interfaces, rather than scanning the terminal ID listed in this table.
** Default for 4600g/4800iXX 03XX models

## *Keyboard Country*

Scan the appropriate country code below to program the keyboard for your country. As a general rule, the following characters are supported, but need special care for countries other than the United States:
@ | $ # { } [ ] = / ‘ \ < > ~

* United States

Belgium

Brazil

Canada (French)

Czech Republic

Denmark

Finland (Sweden)

France

Germany/Austria

Greece

Hungary

Israel (Hebrew)

## *Keyboard Country (continued)*

Italy

Latin America

Netherlands (Dutch)

Norway

Poland

Portugal

Romania

Russia

SCS

Slovakia

Spain

Sweden

Switzerland (German)

## Keyboard Country (continued)

Turkey F

Turkey Q

U.K.

Please refer to the Honeywell website (www.honeywell.com/aidc) for complete keyboard country support information and applicable interfaces. If you need to program a keyboard for a country other than one listed above, scan the **Program Keyboard Country** barcode below, then scan the numeric barcode(s) for the appropriate country from the inside back cover, then the **Save** barcode.

Program Keyboard Country

## Keyboard Style

This programs keyboard styles, such as Caps Lock and Shift Lock. *Default = Regular.*

**Regular** is used when you normally have the Caps Lock key off.

* Regular

**Caps Lock** is used when you normally have the Caps Lock key on.

Caps Lock

**Shift Lock** is used when you normally have the Shift Lock key on (not common to U.S. keyboards).

Shift Lock

**Automatic Caps Lock** is used if you change the Caps Lock key on and off. The software tracks and reflects if you have Caps Lock on or off (AT and PS/2 only). This selection can only be used with systems that have an LED which notes the Caps Lock status.

Automatic Caps Lock

**Autocaps via NumLock** barcode should be scanned in countries (e.g., Germany, France) where the Caps Lock key cannot be used to toggle Caps Lock. The NumLock option works similarly to the regular Auotcaps, but uses the NumLock key to retrieve the current state of the Caps Lock.

Autocaps via NumLock

**Emulate External Keyboard** should be scanned if you do not have an external keyboard (IBM AT or equivalent).

Emulate External Keyboard

*Note: After scanning the Emulate External Keyboard barcode, you must power cycle your computer.*

## *Keyboard Modifiers*

This modifies special keyboard features, such as CTRL+ ASCII codes and Turbo Mode.

**Control + ASCII Mode On***:* The imager sends key combinations for ASCII control characters for values 00-1F. Windows is the preferred mode. All keyboard country codes are supported. DOS mode is a legacy mode, and it does not

support all keyboard country codes.  New users should use the Windows mode. Refer to Keyboard Function Relationships, page 10-1 for CTRL+ ASCII Values. *Default = Off.*

Windows Mode Control + ASCII Mode On

* Control + ASCII Mode Off

DOS Mode Control + ASCII Mode On

**Turbo Mode:** The imager sends characters to a terminal faster. If the terminal drops characters, do not use Turbo Mode. *Default = Off.*

Turbo Mode On

* Turbo Mode Off

**Numeric Keypad Mode***:* Sends numeric characters as if entered from a numeric keypad. *Default = Off.*

Numeric Keypad Mode On

* Numeric Keypad Mode Off

**Automatic Direct Connect Mode:** This selection can be used if you have an IBM AT style terminal and the system is dropping characters. *Default = Off.*

Automatic Direct Connect Mode On

* Automatic Direct Connect Mode Off

## *RS-232 Baud Rate*

Baud Rate sends the data from the imager to the terminal at the specified rate. The host terminal must be set for the same baud rate as the imager.
*Default = 38,400.*

300

600

1200

2400

4800

9600

19200

* 38400

57,600

115,200

## *RS-232 Word Length: Data Bits, Stop Bits, and Parity*

**Data Bits** sets the word length at 7 or 8 bits of data per character. If an application requires only ASCII Hex characters 0 through 7F decimal (text, digits, and punctuation), select 7 data bits. For applications which require use of the full ASCII set, select 8 data bits per character. *Default = 8.*

**Stop Bits** sets the stop bits at 1 or 2. *Default = 1.*

**Parity** provides a means of checking character bit patterns for validity.
*Default = None.*

7 Data, 1 Stop, Parity Even

7 Data, 1 Stop, Parity None

7 Data, 1 Stop, Parity Odd

7 Data, 2 Stop, Parity Even

7 Data, 2 Stop Parity None

7 Data, 2 Stop, Parity Odd

8 Data, 1 Stop, Parity Even

* 8 Data, 1 Stop, Parity None

8 Data, 1 Stop, Parity Odd

### *RS-232 Receiver Time-Out*

The unit stays awake to receive data until the RS-232 Receiver Time-Out expires. A manual or serial trigger resets the time-out. When an RS-232 receiver is sleeping, a character may be sent to wake up the receiver and reset the time-out. A transaction on the CTS line will also wake up the receiver. The receiver takes 300 milliseconds to completely come up. Change the RS-232

receiver time-out by scanning the barcode below, then scanning digits from the inside back cover of this manual, then scanning ***Save***. The range is 0 to 300 seconds. *Default = 0 seconds (no time-out - always on).*

RS-232 Receiver Time-Out

### *RS-232 Handshaking*

RS-232 Handshaking allows control of data transmission from the Imager using software commands from the host device. When this feature is turned ***Off***, no data flow control is used. When Data Flow Control is turned ***On***, the host device suspends transmission by sending the XOFF character (DC3, hex 13) to the Imager. To resume transmission, the host sends the XON character (DC1, hex 11). Data transmission continues where it left off when XOFF was sent. *Default = RTS/CTS, XON/XOFF and ACK/NAK Off.*

RTS/CTS On

* RTS/CTS Off

XON/XOFF On

* XON/OFF Off

ACK/NAK On

* ACK/NAK Off

### *Wand Emulation Connection*

The Wand Emulation Connection barcodes should be used if you want to change the terminal ID *only*, without changing any other imager settings. We recommend using Wand Emulation Plug & Play barcodes to program your imager to emulate a wand reader. The Wand Emulation Plug & Play barcodes change other parameters, in addition to changing the terminal ID. Please refer to Connecting the Imager with RS-232 Wedge on page 1-6 for further information.

In Wand Emulation mode, the imager decodes the barcode then sends data in the same format as a wand imager. The **Code 39 Format** converts all symbologies to Code 39.

The **Same Code Format** transmits UPC, EAN, Code 128, Codabar, and Interleaved 2 of 5 without any changes, but converts all other symbologies to Code 39. 2D symbologies are converted to Code 128.

The **Code 39 Format** barcode below sets the terminal ID to 61, and the **Same Code Format** barcode sets the terminal ID to 64. *Default = Code 39 Format.*

Code 39 Format

Same Code Format

## *Wand Emulation*

*Note: See* *"Imager Models" on page 1-2* *to determine which interfaces apply to your imager.*

*Note: Changing primary wand emulation settings also changes the secondary wand emulation settings (see* *Secondary Code 39 Wand Emulation on page 6-2**).*

### *Data Block Size*

This transmits the data in smaller blocks to prevent buffer overflow. *Default = 40.*

20

* 40

60

80

### *Delay Between Blocks*

This sets the delay time between data blocks. *Default = 50ms.*

5ms

* 50ms

150ms

500ms

### *Overall Checksum*

When this option is turned on, a computed check character is added at the end of the entire message. The check character is the character which when Exclusive-OR'd with every preceding character of the message yields a result of 0x00 (00H). *Default = Off.*

On

* Off

## *Wand Emulation Transmission Rate*

The Transmission Rate is limited by the terminal's ability to receive data without dropping characters. *Default = 25 inches/second.*

10

* 25

40

80

120

150

200

## *Wand Emulation Polarity*

The Polarity can be sent as standard with black bars high, or reversed with white bars high. *Default = Black High.*

* Black High

White High

### *Wand Emulation Idle*

The idle describes the state of the imager when no data is being transmitted. When in Wand Emulation mode, you must set the imager's idle state to match the idle state for the device to which the imager is connected. *Default = Idle High*.

* Idle High

Idle Low

# 3 Output

## Good Read Indicators

### Beeper – Good Read

The beeper may be programmed ***On*** or ***Off*** in response to a good read. Turning this option off, only turns off the beeper response to a good read indication. All error and menu beeps are still audible. *Default = On.*

* On

Off

### Beeper Volume – Good Read

The beeper volume codes modify the volume of the beep the imager emits on a good read. *Default = Medium for the 4600g/4600r/4600rp; High for the 4800i.*

Low

Medium

High

Off

## *Beeper Pitch – Good Read*

The beeper pitch codes modify the pitch (frequency) of the beep the imager emits on a good read. *Default = Medium.*

Low (1600 Hz)

* Medium (3250 Hz)

High (4200 Hz)

## *Beeper Duration – Good Read*

The beeper duration codes modify the length of the beep the imager emits on a good read. *Default = Normal.*

* Normal Beep

Short Beep

## *LED – Good Read*

The LED indicator can be programmed ***On*** or ***Off*** in response to a good read. *Default = On.*

* On

Off

## *Number of Beeps – Good Read*

The number of beeps of a good read can be programmed from 1 - 9. The same number of beeps will be applied to the beeper and LED in response to a good read. For example, if you program this option to have five beeps, there will be five beeps and five LED flashes in response to a good read. The beeps and

LED flashes are in sync with one another. To change the number of beeps, scan the barcodebarcode below and then scan a digit (1-9) barcode and the **Save** barcode on the Programming Chart inside the back cover of this manual. *Default = One.*

Number of Pulses

## *Good Read Delay*

This sets the minimum amount of time before the imager can read another bar-code. *Default = No Delay.*

* No Delay

Short Delay (500 ms)

Medium Delay (1,000 ms)

Long Delay (1,500 ms)

## *User-Specified Good Read Delay*

If you want to set your own length for the good read delay, scan the barcode below, then set the delay (from 0-30,000 milliseconds) by scanning digits from the inside back cover, then scanning **Save**.

User-Specified Good Read Delay

# Trigger Modes

## Manual/Serial Trigger

You can activate the imager either by pressing the trigger, or using a serial trigger command (see Trigger Commands on page 12-4). When in manual trigger mode, the imager scans until a barcode is read, or until the trigger is released.

When in serial mode, the imager scans until a barcode has been read or until the deactivate command is sent. The imager can also be set to turn itself off after a specified time has elapsed (see Read Time-Out, which follows).

* Manual/Serial Trigger

## Read Time-Out

Use this selection to set a time-out (in milliseconds) of the imager's trigger when using serial commands to trigger the imager, or if the imager is in manual trigger mode. Once the imager has timed out, you can activate the imager either by pressing the trigger or using a serial trigger command. After scanning the **Read Time-Out** barcode, set the time-out duration (from 0-300,000 milliseconds) by scanning digits from the inside back cover, then scanning **Save**. *Default = 30,000.*

Read Time-Out

## Manual Trigger, Low Power

*Note: Does not apply to the 4600r.*

The imager powers down until the trigger is pulled. When the trigger is pulled, the imager powers up and operates until there is no triggering for the time set with the **Low Power Time-Out** barcode below. There is a delay of up to one second in operation when the imager is first triggered, but there is no delay when operating in low power time-out mode.

Manual Trigger, Low Power

*Note: **Manual Trigger, Low Power** cannot be used with keyboard wedge applications.*

### *Low Power Time-Out Timer*

Scan the **Low Power Time-Out** barcode to change the time-out duration (in seconds). Then scan the time-out duration (from 0-300 seconds) from the inside back cover, and **Save**. *Default = 120 seconds.*

If the unit remains idle during the low power time-out interval, the unit goes into low power mode. Whenever the trigger is enabled, the low power time-out timer is reset.

Low Power Time-Out

*Note: This time-out does not begin until the imager time-out setting has expired.*

## *In-Stand Sensor Mode (4600r only)*

*Note: This feature is only applicable to the flex stand with sensor (HFSTAND5RSE) used with a 4600r, software revision 31205480-118 or higher. To determine whether you have the correct hardware and software, scan the **Sensor On** barcode. If it triple beeps, your device does not have this capability.*

This feature tells a 4600r to sense when the scanner is removed from the stand and to begin manual triggering. When you scan **Sensor On**, the imager goes into manual trigger mode when it is removed from the stand. For example, if the 4600r is programmed for Presentation Mode (page 3-7), it would be in presentation mode whenever it is in the stand, and in manual trigger mode whenever it is removed from the stand. *Default = Sensor Off.*

Sensor On

* Sensor Off

# Scan Stand Mode

When a unit is in Scan Stand mode, it remains idle as long as it sees the Scan Stand symbol (see below). When a different code is presented, the imager is triggered to read the new code.

*Note: The imager automatically adjusts the illumination LEDs to the lowest light level possible to maintain a good lock on the Scan Stand symbol. When a symbol is presented, the imager's light levels adjust to the saved setting (see LED Power Level on page 3-10). This mode requires at least 50 lux of ambient light to operate correctly.*

Scan Stand Mode

## Scan Stand Symbol

When a unit is in Scan Stand mode, the LEDs shine at the Scan Stand symbol on the base of the stand which tells it to remain idle. When the Scan Stand symbol is covered, the imager turns the LEDs on at the configured power level (default setting is high) and attempts to find and decode barcodes in its field of view.

Scan Stand Symbol

# Presentation Mode

This programs the imager to work in Presentation mode. The LEDs are either off or at the lowest power for ambient conditions until a barcode is presented to the imager. Then the LEDs turn on automatically to read the code. Presentation Mode uses ambient light to detect the barcodes. If the light level in the room is not high enough, Presentation Mode may not work properly.

Presentation Mode

*Note: The operation of advanced illumination units and non-advanced illumination units differs slightly. When an advanced illumination unit is in Presentation Mode and idle, the illumination LEDs go dim, but never go out. When a non-advanced illumination unit is in Presentation Mode and idle, the illumination LEDs go out completely.*



Non-Advanced Illumination Unit    Advanced Illumination Unit

## Presentation LED Behavior after Decode

When an imager is in presentation mode, the LEDs remain on and continue scanning for a short time after a barcode is decoded. If you wish to turn the LEDs off immediately after a barcode is decoded, scan the **LEDs Off** barcode, below. *Default = LEDs On.*

* LEDs On

LEDs Off

### *Presentation Sensitivity*

Presentation Sensitivity is a numeric range that increases or decreases the imager's reaction time to barcode presentation. To set the sensitivity, scan the **Sensitivity** barcode, then scan the degree of sensitivity (from 0-20) from the inside back cover, and **Save**. 0 is the most sensitive setting, and 20 is the least sensitive. *Default = 1.*

Sensitivity

## *Streaming Presentation™ Mode*

When in Streaming Presentation mode, the imager's aimer goes out after a short time, but the scan illumination remains on all the time to continuously search for barcodes.

Streaming Presentation Mode

When using Preferred Symbology (page 3-15), a lower priority symbol must be centered on the aiming pattern to be read in Streaming Presentation Mode.

*Note: Streaming Presentation Mode applies only to advanced illumination units.*



Non-Advanced Illumination Unit | Advanced Illumination Unit

## Image Snap and Ship

**Image Snap and Ship** tells the imager to take a picture (rather than read a barcode) when the trigger is pressed. Once the picture is snapped, it is shipped to the host system as a jpeg file by default. To revert to barcode reading, you must change to a different trigger mode (see Trigger Modes beginning on page 3-4).

Image Snap and Ship

## Hands Free Time-Out

The Scan Stand, and Presentation, and Streaming Presentation Modes are referred to as "hands free" modes. If the imager's trigger is pulled when using a hands free mode, the imager changes to manual trigger mode. You can set the time the imager should remain in manual trigger mode by setting the Hands Free Time-Out. Once the time-out value is reached, (if there have been no further trigger pulls) the imager reverts to the original hands free mode.

Scan the **Hands Free Time-Out** barcode, then scan the time-out duration (from 0-300,000 milliseconds) from the inside back cover, and **Save**. *Default = 5,000 ms.*

Hands Free Time-Out

## Reread Delay

This sets the time period before the imager can read the *same* barcode a second time. Setting a reread delay protects against accidental rereads of the same barcode. Longer delays are effective in minimizing accidental rereads. Use shorter delays in applications where repetitive barcode scanning is required. *Default = Medium.*

Reread Delay only works when in Presentation Mode or Streaming Presentation™ Mode (page 3-8).

Short (500 ms)

* Medium (750 ms)

Long (1000 ms)

Extra Long (2000 ms)

## User-Specified Reread Delay

If you want to set your own length for the reread delay, scan the barcode below, then set the delay (from 0-30,000 milliseconds) by scanning digits from the inside back cover, then scanning **Save**.

User-Specified Reread Delay

## LED Power Level

This selection allows you to adjust LED and aimer brightness. **Off** is used when no illumination is needed. **Low** is used if low illumination is sufficient. **High** (the default) is the brightest setting.

If you have an aimer delay programmed (see Aimer Delay on page 3-12), the aimer will be at 100% power during the delay, regardless of the LED Power Level.

*Note: If you scan the **Off** barcode, both the aimer and illumination lights turn off, making it impossible to scan barcodes in low light. To turn the LED Power Level back on, move to a brightly lit area and scan either the **Low** or the **High** barcode below.*

Off

Low (50%)

* High (100%)

## *Illumination Lights*

If you want the illumination lights on while reading a barcode, scan the **Lights On** barcode, below. However, if you want to turn just the lights off, scan the **Lights Off** barcode. *Default = Lights On.*

*Note: This setting does not affect the aimer light. The aiming light can be set using Aimer Mode (page 3-13).*

* Lights On

Lights Off

## Imager Time-Out

Imager Time-Out powers down the imager after the unit has been idle for the specified time. To prevent the imager from powering down, set this time-out to 0. Scan **Imager Time-Out**, then set the time-out by scanning digits (from 0 - 999,999 ms) from the inside back cover, then scanning **Save.** *Default = 60,000 ms.*

*Note: The default applies to firmware with a base number of 31205480. Refer to the Show Software Revision on page 11-2 for information on determining the firmware revision in your unit.*

Imager Time-Out

## Aimer Delay

The aimer delay allows a delay time for the operator to aim the imager before the picture is taken. Use these codes to set the time between when the trigger is pulled and when the picture is taken. During the delay time, the aiming light will appear, but the LEDs won't turn on until the delay time is over. *Default = Off.*

200 milliseconds

400 milliseconds

***** Off *(no delay)*

### User-Specified Aimer Delay

If you want to set your own length for the duration of the delay, scan the barcode below, then set the time-out by scanning digits (0 - 4,000 ms) from the Programming Chart inside the back cover of this manual, then scan **Save**.

Delay Duration

# *Aimer Mode*

This feature allows you to turn the aimer on and off. When the Interlaced bar-code is scanned, the aimer is interlaced with the illumination LEDs. *Default = Interlaced.*

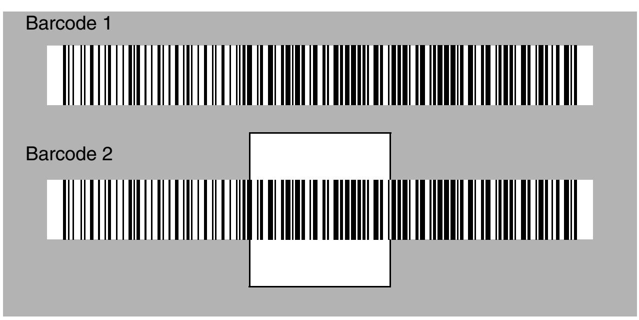
Off

*Interlaced

# *Centering*

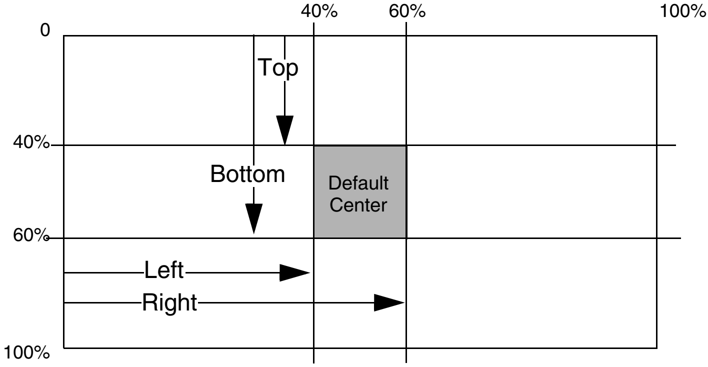
Use Centering to narrow the imager's field of view to make sure the imager reads only those barcodes intended by the user. For instance, if multiple codes are placed closely together, centering will insure that only the desired codes are read. (Centering can be used in conjunction with Aimer Delay, page 3-12, for the most error-free operation in applications where multiple codes are spaced closely together. Using the Aimer Delay and Centering features, the imager can emulate the operation of older systems, such as linear laser barcode imagers.)

In the example below, the gray area is the full imager field of view and the white area is the centering window. Barcode 1 will not be read, while Barcode 2 will be.




The default centering window is a 128x96 pixel area in the center of the

imager's field of view. The following diagram illustrates the default top, bottom, left, and right pixel positions, measured from the top and the left side of the imager's field of view, which is 640 by 480 pixels.




If a barcode is not within the predefined window, it will not be decoded or output by the imager. If centering is turned on by scanning **Centering On**, the imager only reads codes that intersect the centering window you specify using the **Top**, **Bottom**, **Left**, or **Right** barcodes.

Scan **Centering On**, then scan one of the following barcodes to change the top, bottom, left, or right of the centering window. Then scan the percent you want to shift the centering window using digits on the inside back cover of this manual. Scan **Save**. *Default Centering = 40% for Top and Left, 60% for Bottom and Right.*

Centering On

* Centering Off

Top of Centering Window

Bottom of Centering Window

Left of Centering Window

Right of Centering Window

## Decode Search Mode

There are three selectable decode (scanning) modes:

***Full Omnidirectional*** - Searches for barcode features beginning at the center of an image, and searches to the image's limits. This mode reads all symbologies (including OCR), in any orientation. The Full Omnidirectional search is very thorough which may slow performance time.

*Note: This search mode is the default setting.*

Full Omnidirectional

***Quick Omnidirectional*** - This is an abbreviated search for barcode features around the center region of an image. This mode quickly reads all symbologies in any orientation. The Quick Omnidirectional mode may miss some off-center symbols, as well as larger Data Matrix and QR Code symbols.

Quick Omnidirectional

***Advanced Linear Decoding*** - Performs quick horizontal linear scans in a center band of the image. This mode is *not* omnidirectional, but does quickly read linear and stacked barcodes. Advanced Linear Decoding cannot read 2D, OCR, or Postal symbols.

Advanced Linear Decoding

## Preferred Symbology

*Note: This selection does not apply to OCR.*

The imager can be programmed to specify one symbology as a higher priority over other symbologies in situations where both barcode symbologies appear on the same label, but the lower priority symbology cannot be disabled.

For example, you may be using the imager in a retail setting to read UPC symbols, but have occasional need to read a code on a drivers license. Since some licenses have a Code 39 symbol as well as the PDF417 symbol, you can use Preferred Symbology to specify that the PDF417 symbol be read instead of the Code 39.

Preferred Symbology classifies each symbology as **high priority**, **low priority**, or as an **unspecified type**. When a low priority symbology is presented, the imager ignores it for a set period of time (see Preferred Symbology Time-out on page 3-17) while it searches for the high priority symbology. If a high priority symbology is located during this period, then that data is read immediately.

If the time-out period expires before a high priority symbology is read, the imager will read any barcode in its view (low priority or unspecified). If there is no barcode in the imager's view after the time-out period expires, then no data is reported.

*Note: A low priority symbol must be centered on the aiming pattern to be read.*

Scan a barcode below to enable or disable Preferred Symbology. *Default = Preferred Symbology Off.*

Preferred Symbology On

* Preferred Symbology Off

### *High Priority Symbology*

To specify the high priority symbology, scan the **High Priority Symbology** barcode below. On the Symbology Chart on page A-1, find the symbology you want to set as high priority. Locate the Hex value for that symbology and scan the 2 digit hex value from the Programming Chart (inside back cover). Scan **Save** to save your selection. *Default = None*

High Priority Symbology

### *Low Priority Symbology*

To specify the low priority symbology, scan the **Low Priority Symbology** barcode below. On the Symbology Chart on page A-1, find the symbology you want to set as low priority. Locate the Hex value for that symbology and scan the 2 digit hex value from the Programming Chart (inside back cover).

If you want to set additional low priority symbologies, scan **FF**, then scan the 2 digit hex value from the Programming Chart for the next symbology. You can program up to 5 low priority symbologies. Scan **Save** to save your selection. *Default = None*

Low Priority Symbology

### *Preferred Symbology Time-out*

Once you have enabled Preferred Symbology and entered the high and low priority symbologies, you must set the time-out period. This is the period of time the imager will search for a high priority barcode after a low priority barcode has been encountered. Scan the barcode below, then set the delay (from 100-3,000 milliseconds) by scanning digits from the inside back cover, then scanning **Save**. *Default = 500 ms.*

Preferred Symbology Time-out

### *Preferred Symbology Default*

Scan the barcode below to set all Preferred Symbology entries to their default values.

Preferred Symbology Default

## *Output Sequence Overview*

**Require Output Sequence**

When turned off, the barcode data will be output to the host as the Imager decodes it. When turned on, all output data must conform to an edited sequence or the imager will not transmit the output data to the host device.

*Note: This selection is unavailable when Multiple Symbols (page 3-20) is enabled.*

**Output Sequence Editor**

This programming selection allows you to program the imager to output data (when scanning more than one symbol) in whatever order your application requires, regardless of the order in which the barcodes are scanned. Reading the **Default Sequence** symbol programs the imager to the Universal values, shown below. These are the defaults. Be *certain* you want to delete or clear all formats before you read the **Default Sequence** symbol.

*Note: To make Output Sequence Editor selections, you'll need to know the code I.D., code length, and character match(es) your application requires. Use the Alphanumeric symbols (inside back cover) to read these options. You must hold the trigger while reading each barcode in the sequence.*

To Add an Output Sequence

1. Scan the **Enter Sequence** symbol (see Require Output Sequence, page 3-20).
2. **Code I.D.**
   On the Symbology Chart on page A-1, find the symbology to which you want

to apply the output sequence format.  Locate the Hex value for that symbology and scan the 2 digit hex value from the Programming Chart (inside back cover).

3. **Length**
   Specify what length (up to 9999 characters) of data output will be acceptable for this symbology.  Scan the four digit data length from the Programming Chart.  (Note:  50 characters is entered as 0050.  9999 is a universal number, indicating all lengths.)  When calculating the length, you must count any programmed prefixes, suffixes, or formatted characters as part of the length (unless using 9999).

4. **Character Match Sequences**
   On the ASCII Conversion Chart (Code Page 1252), page A-4, find the Hex value that represents the character(s) you want to match.  Use the Programming Chart to read the alphanumeric combination that represents the ASCII characters.  (99 is the Universal number, indicating all characters.)

5. **End Output Sequence Editor**
   Scan **F F** to enter an Output Sequence for an additional symbology, or **Save** to save your entries.

Other Programming Selections

- **Discard**
  This exits without saving any Output Sequence changes.

### *Output Sequence Examples*

In this example, you are scanning Code 93, Code 128, and Code 39 barcodes, but you want the imager to output Code 39 1st, Code 128 2nd, and Code 93 3rd, as shown below.

*Note:  Code 93 must be enabled to use this example.*

A - Code 39

B - Code 128

C - Code 93

You would set up the sequence editor with the following command line:

SEQBLK62999941FF6A999942FF69999943FF

The breakdown of the command line is shown below:

| | |
|---|---|
| SEQBLK | sequence editor start command |
| 62 | code identifier for **Code 39** |
| 9999 | code length that must match for Code 39, 9999 = all lengths |
| 41 | start character match for Code 39, 41h = “A” |
| FF | termination string for first code |
| 6A | code identifier for **Code 128** |
| 9999 | code length that must match for Code 128, 9999 = all lengths |
| 42 | start character match for Code 128, 42h = “B” |
| FF | termination string for second code |
| 69 | code identifier for **Code 93** |
| 9999 | code length that must match for Code 93, 9999 = all lengths |
| 43 | start character match for Code 93, 43h = “C” |
| FF | termination string for third code |

To program the previous example using specific lengths, you would have to count any programmed prefixes, suffixes, or formatted characters as part of the length. If you use the example on page 3-18, but assume a <CR> suffix and specific code lengths, you would use the following command line:

SEQBLK62001241FF6A001342FF69001243FF

The breakdown of the command line is shown below:

| | |
|---|---|
| SEQBLK | sequence editor start command |
| 62 | code identifier for **Code 39** |
| 0012 | A - Code 39 sample length (11) plus CR suffix (1) = 12 |
| 41 | start character match for Code 39, 41h = “A” |
| FF | termination string for first code |
| 6A | code identifier for **Code 128** |
| 0013 | B - Code 128 sample length (12) plus CR suffix (1) = 13 |
| 42 | start character match for Code 128, 42h = “B” |
| FF | termination string for second code |
| 69 | code identifier for **Code 93** |
| 0012 | C - Code 93 sample length (11) plus CR suffix (1) = 12 |
| 43 | start character match for Code 93, 43h = “C” |
| FF | termination string for third code |

### *Output Sequence Editor*

Enter Sequence

Default Sequence

### *Require Output Sequence*

When an output sequence is **Required**, all output data must conform to an edited sequence or the imager will not transmit the output data to the host device. When it's **On/Not Required**, the imager will attempt to get the output data to conform to an edited sequence but, if it cannot, the imager transmits all output data to the host device as is.

When the output sequence is **Off**, the barcode data is output to the host as the imager decodes it. *Default = Off.*

*Note: This selection is unavailable when the Multiple Symbols Selection is turned on.*

Required

On/Not Required

*Off

## *Multiple Symbols*

*Note: This feature does not work when the Imager is in Low Power mode.*

When this programming selection is turned **On**, it allows you to read multiple symbols with a single pull of the Imager's trigger. If you press and hold the trigger, aiming the Imager at a series of symbols, it reads unique symbols once, beeping (if turned on) for each read. The imager attempts to find and decode

new symbols as long as the trigger is pulled. When this programming selection is turned **Off**, the Imager will only read the symbol closest to the aiming beam. *Default = Off.*

On

* Off

## No Read

With No Read turned **On**, the Imager notifies you if a code cannot be read. If using a Quick*View Scan Data Window, an "NR" appears when a code cannot be read. If No Read is turned **Off**, the "NR" will not appear. *Default = Off.*

On

* Off

If you want a different notation than "NR," for example, "Error," or "Bad Code," you can edit the output message using the Data Formatter (page 5-5). The hex code for the No Read symbol is 9C.

## Print Weight

Print Weight is used to adjust the way the imager reads Matrix symbols. If an imager will be seeing consistently heavily printed matrix symbols, then a print weight of 6 may improve the reading performance. For consistently light printing, a print weight of 2 may help. After scanning the **Set Print Weight** barcode, set the print weight (from 1-7) by scanning digits from the inside back cover, then scanning **Save**. *Default = 4*.

Set Print Weight

* Default

## Video Reverse

Video Reverse is used to allow the imager to read barcodes that are inverted. The **Off** barcode below is an example of this type of barcode. If additional menuing is required, Video Reverse must be disabled to read the menu barcodes and then re-enabled after menuing is completed. *Default = Off.*

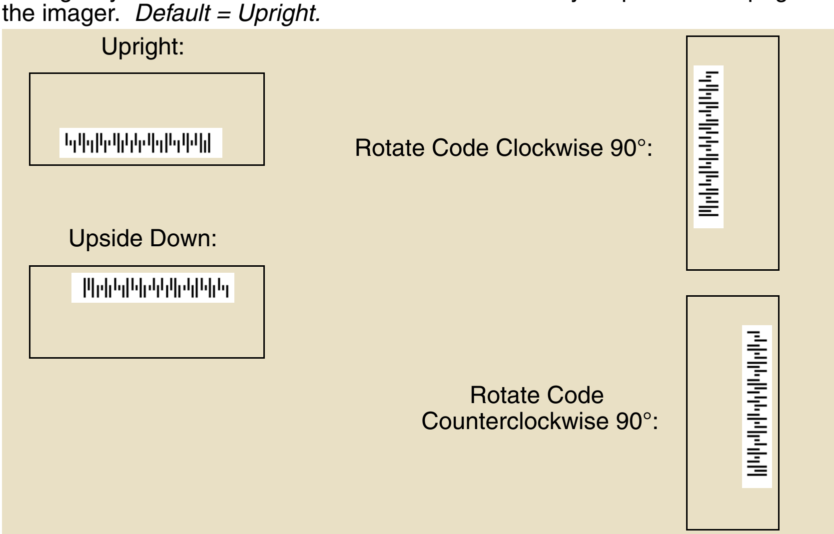
*Note: Images downloaded from the unit will not be reversed. This is a setting for decoding only.*

On

* Off

## Working Orientation

Some barcodes are direction-sensitive. For example, KIX codes and OCR can misread when scanned sideways or upside down. Use the working orientation settings if your direction-sensitive codes will not usually be presented upright to the imager. *Default = Upright.*



* Upright

Upside Down

Rotate Code Clockwise 90°
(Rotate Imager
Counterclockwise)

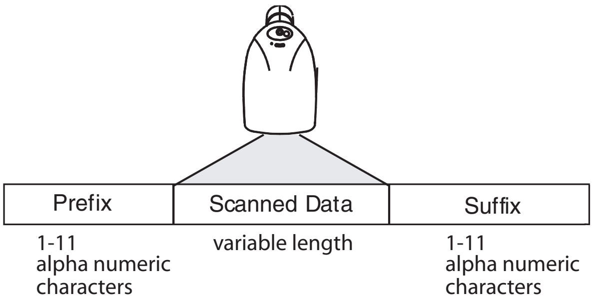
Rotate Code
Counterclockwise 90°
(Rotate Imager Clockwise)

# 4 Data Editing

## Prefix/Suffix Overview

When a barcode is scanned, additional information is sent to the host computer along with the barcode data. This group of barcode data and additional, user-defined data is called a “message string.” The selections in this section are used to build the user-defined data into the message string.

Prefix and Suffix characters are data characters that can be sent before and after scanned data. You can specify if they should be sent with all symbologies, or only with specific symbologies. The following illustration shows the breakdown of a message string:




### Points to Keep In Mind

- It is not necessary to build a message string. The selections in this chapter are only used if you wish to alter the default settings. *Default prefix = None. Default suffix = None*.
- A prefix or suffix may be added or cleared from one symbology or all symbologies.
- You can add any prefix or suffix from the ASCII Conversion Chart (Code Page 1252), page A-4, plus Code I.D. and AIM I.D.
- You can string together several entries for several symbologies at one time.
- Enter prefixes and suffixes in the order in which you want them to appear on the output.
- When setting up for specific symbologies, instead of All Symbologies, the symbology ID value counts as an added prefix or suffix character.

### *To Add a Prefix or Suffix:*

**Step 1.** Scan the **Add Prefix** or **Add Suffix** symbol (page 4-4).

**Step 2.** Determine the 2 digit Hex value from the Symbology Chart (see page A-1) for the symbology to which you want to apply the prefix or suffix. For example, for Code 128, Code ID is "j" and Hex ID is "6A".

**Step 3.** Scan the 2 hex digits from the Programming Chart inside the back cover of this manual or scan **9**, **9** for all symbologies.

**Step 4.** Determine the hex value from the ASCII Conversion Chart (Code Page 1252), page A-4, for the prefix or suffix you wish to enter.

**Step 5.** Scan the 2 digit hex value from the Programming Chart inside the back cover of this manual.

**Step 6.** Repeat Steps 4 and 5 for every prefix or suffix character.

**Step 7.** To add the Code I.D., scan **5**, **C**, **8**, **0**.
To add AIM I.D., scan **5**, **C**, **8**, **1**.
To add a backslash (\), scan **5**, **C**, **5**, **C**.

*Note: To add a backslash (\) as in Step 7, you must scan 5C twice – once to create the leading backslash and then to create the backslash itself.*

**Step 8.** Scan **Save** to exit and save, or scan **Discard** to exit without saving.

Repeat Steps 1-6 to add a prefix or suffix for another symbology.

### *Example: Add a Suffix to a specific symbology*

To send a CR (carriage return) Suffix for UPC only:

**Step 1.** Scan **Add Suffix**.

**Step 2.** Determine the 2 digit hex value from the Symbology Chart (see page A-1) for UPC.

**Step 3.** Scan **6**, **3** from the Programming Chart inside the back cover of this manual.

**Step 4.** Determine the hex value from the ASCII Conversion Chart (Code Page 1252), page A-4, for the CR (carriage return).

**Step 5.** Scan **0**, **D** from the Programming Chart inside the back cover of this manual.

**Step 6.** Scan **Save**, or scan **Discard** to exit without saving.

### *To Clear One or All Prefixes or Suffixes:*

You can clear a single prefix or suffix, or clear all prefixes/suffixes for a symbology. When you Clear One Prefix (Suffix), the specific character you select is deleted from the symbology you want. When you Clear All Prefixes (Suffixes), all the prefixes or suffixes for a symbology are deleted.

**Step 1.** Scan the **Clear One Prefix** or **Clear One Suffix** symbol.

**Step 2.** Determine the 2 digit Hex value from the Symbology Chart (see page A-1) for the symbology from which you want to clear the prefix or suffix.

**Step 3.** Scan the 2 digit hex value from the Programming Chart inside the back cover of this manual or scan **9**, **9** for all symbologies.

Your change is automatically saved.

### *To Add a Carriage Return Suffix to all Symbologies*

Scan the following barcode if you wish to add a carriage return suffix to all symbologies at once. This action first clears all current suffixes, then programs a carriage return suffix for all symbologies.

Add CR Suffix
All Symbologies

### Prefix Selections

Add Prefix

Clear One Prefix

Clear All Prefixes

### Suffix Selections

Add Suffix

Clear One Suffix

Clear All Suffixes

### Function Code Transmit

When this selection is enabled and function codes are contained within the scanned data, the imager transmits the function code to the terminal. Charts of these function codes are provided in Supported Interface Keys starting on page 10-3. When the imager is in keyboard wedge mode, the scan code is converted to a key code before it is transmitted. *Default = Enable.*

* Enable

Disable

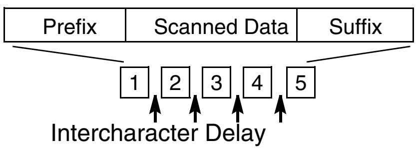
# *Intercharacter, Interfunction, and Intermessage Delays*

Some terminals drop information (characters) if data comes through too quickly. Intercharacter, interfunction, and intermessage delays slow the transmission of data, increasing data integrity.

Each delay is composed of a 5 millisecond step. You can program up to 99 steps (of 5 ms each) for a range of 0-495 ms.

## *Intercharacter Delay*

An intercharacter delay of up to 495 milliseconds (in 5 ms steps) may be placed between the transmission of each character of scanned data. Scan the **Intercharacter Delay** barcode below, then scan the number of 5 millisecond steps (0-99), and the **Save** barcode using the Programming Chart inside the back cover of this manual.




Intercharacter Delay

To remove this delay, scan the **Intercharacter Delay** barcode, then set the number of steps to 0. Scan the **Save** barcode using the Programming Chart inside the back cover of this manual.

*Note: Intercharacter delays are not supported in USB serial emulation.*

## *User Specified Intercharacter Delay*

An intercharacter delay of up to 495 milliseconds (in 5 ms steps) may be placed after the transmission of a particular character of scanned data. Scan the **Delay Length** barcode below, then scan the number of 5 millisecond steps (0-99), and the **Save** barcode using the Programming Chart inside the back cover of this manual.

Next, scan the **Character to Trigger Delay** barcode, then the 2-digit hex value for the ASCII character that will trigger the delay ASCII Conversion Chart (Code Page 1252), page A-4.

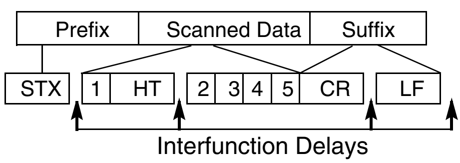
Delay Length

Character to Trigger Delay

To remove this delay, scan the **Delay Length** barcode, and set the number of steps to 0.  Scan the **Save** barcode using the Programming Chart inside the back cover of this manual.

### *Interfunction Delay*

An interfunction delay of up to 495 milliseconds (in 5 ms steps) may be placed between the transmission of each segment of the message string.  Scan the **Interfunction Delay** barcode below, then scan the number of 5 millisecond steps (0-99), and the **Save** barcode using the Programming Chart inside the back cover of this manual.

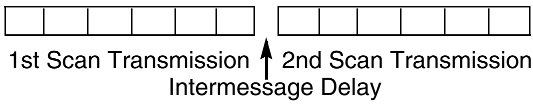



Interfunction Delay

To remove this delay, scan the **Interfunction Delay** barcode, then set the number of steps to 0.  Scan the **Save** barcode using the Programming Chart inside the back cover of this manual.

### *Intermessage Delay*

An intermessage delay of up to 495 milliseconds (in 5 ms steps) may be placed between each scan transmission. Scan the **Intermessage Delay** barcode below, then scan the number of 5 millisecond steps (0-99), and the **Save** barcode using the Programming Chart inside the back cover of this manual.




Intermessage Delay

To remove this delay, scan the **Intermessage Delay** barcode, then set the number of steps to 0. Scan the **Save** barcode using the Programming Chart inside the back cover of this manual.

# 5 Data Formatting

## Data Format Editor Introduction

You may use the Data Format Editor to change the imager's output. For example, you can use the Data Format Editor to insert characters at certain points in barcode data as it is scanned. The selections in the following pages are used only if you wish to alter the output. *Default Data Format setting = None.*

Normally, when you scan a barcode, it gets outputted automatically; however when you do a format, you must use a "send" command (see Send Commands on page 5-2) within the format program to output data.

Multiple formats may be programmed into the imager. They are stacked in the order in which they are entered. However, the following list presents the order in which formats are applied:

1. Specific Term ID, Actual Code ID, Actual Length
2. Specific Term ID, Actual Code ID, Universal Length
3. Specific Term ID, Universal Code ID, Actual Length
4. Specific Term ID, Universal Code ID, Universal Length
5. Universal Term ID, Actual Code ID, Actual Length
6. Universal Term ID, Actual Code ID, Universal Length
7. Universal Term ID, Universal Code ID, Actual Length
8. Universal Term ID, Universal Code ID, Universal Length

If you have changed data format settings, and wish to clear all formats and return to the factory defaults, scan the **Default Data Format** code on page 5-5.

### To Add a Data Format

**Step 1.** Scan the **Enter Data Format** symbol (page 5-5).

**Step 2. Primary/Alternate Format**

Determine if this will be your primary data format, or one of 3 alternate formats. (Alternate formats allow you "single shot" capability to scan one barcode using a different data format. After the one barcode has been read, the imager reverts to the primary data format. See page 5-6.) If you are programming the primary format, scan **0** using the Programming Chart inside the back cover of this manual. If you are programming an alternate format, scan **1**, **2**, or **3**, depending on the alternate format you are programming.

**Step 3. Terminal Type**

Refer to Supported Terminals (page 2-2) and locate the Terminal ID number for your PC. Scan three numeric barcodes on the inside back cover to program the imager for your terminal ID (you must enter 3 digits). For example, scan **0 0 3** for an AT wedge.

*Note: The wildcard for all terminal types is 099.*

**Step 4. Code I.D.**

In the Symbology Chart (page A-1), find the symbology to which you want to apply the data format. Locate the Hex value for that symbology and scan the 2 digit hex value from the Programming Chart inside the back cover of this manual.

**Step 5. Length**

Specify what length (up to 9999 characters) of data will be acceptable for this symbology. Scan the four digit data length from the Programming Chart inside the back cover of this manual. (Note: 50 characters is entered as 0050. 9999 is a universal number, indicating all lengths.)

**Step 6. Editor Commands**

Refer to Data Format Editor Commands (page 5-2). Scan the symbols that represent the command you want to enter. 94 alphanumeric characters may be entered for each symbology data format.

**Step 7.** Scan **Save** from the Programming Chart inside the back cover of this manual to save your entries.

## *Other Programming Selections*

- **Clear One Data Format**
  This deletes one data format for one symbology. If you are clearing the primary format, scan **0** from the Programming Chart inside the back cover of this manual. If you are clearing an alternate format, scan **1**, **2**, or **3**, depending on the alternate format you are clearing. Scan the Terminal Type and Code I.D. (see Supported Terminals on page 2-2), and the barcode data length for the specific data format that you want to delete. All other formats remain unaffected.
- **Save** from the Programming Chart inside the back cover of this manual
  This exits, saving any Data Format changes.
- **Discard** from the Programming Chart inside the back cover of this manual
  This exits without saving any Data Format changes.

## *Data Format Editor Commands*

### *Send Commands*

F1 Send all characters followed by "xx" key or function code, starting from current cursor position. ***Syntax = F1xx*** (xx stands for the hex value for an ASCII code, see ASCII Conversion Chart (Code Page 1252), page A-4.)

F2 Send "nn" characters followed by "xx" key or function code, starting from current cursor position. ***Syntax = F2nnxx*** (nn stands for the numeric value (00-99) for the number of characters and xx stands for the hex value for an ASCII code. See ASCII Conversion Chart (Code Page 1252), page A-4.)

F3 Send up to but not including "ss" character (Search and Send) starting from current cursor position, leaving cursor pointing to "ss" character followed by "xx" key or function code. ***Syntax = F3ssxx*** (ss and xx both stand for the hex values for ASCII codes, see ASCII Conversion Chart (Code Page 1252), page A-4.)

F4 Send “xx” character “nn” times (Insert) leaving cursor in current cursor position. ***Syntax = F4xxnn*** (xx stands for the hex value for an ASCII code, see ASCII Conversion Chart (Code Page 1252), page A-4, and nn is the numeric value (00-99) for the number of times it should be sent.)

E9 Send all but the last “nn” characters, starting from the current cursor position. ***Syntax = E9nn*** (nn is the numeric value (00-99) for the number of characters that will not be sent at the end of the message.)

### *Move Commands*

F5 Move the cursor ahead “nn” characters from current cursor position. ***Syntax = F5nn*** (nn stands for the numeric value (00-99) for the number of characters the cursor should be moved ahead.)

F6 Move the cursor back “nn” characters from current cursor position. ***Syntax = F6nn*** (nn stands for the numeric value (00-99) for the number of characters the cursor should be moved back.)

F7 Move the cursor to the beginning of the data string. ***Syntax = F7.***

EA Move the cursor to the end of the data string. ***Syntax = EA***

### *Search Commands*

F8 Search ahead for “xx” character from current cursor position, leaving cursor pointing to “xx” character. ***Syntax = F8xx*** (xx stands for the hex value for an ASCII code, see ASCII Conversion Chart (Code Page 1252), page A-4.)

F9 Search back for “xx” character from current cursor position, leaving cursor pointing to “xx” character. ***Syntax = F9xx*** (xx stands for the hex value for an ASCII code, see ASCII Conversion Chart (Code Page 1252), page A-4.)

E6 Search ahead for the first non “xx” character from the current cursor position, leaving cursor pointing to non “xx” character. ***Syntax = E6xx*** (xx stands for the hex value for an ASCII code, see ASCII Conversion Chart (Code Page 1252), page A-4.

E7 Search back for the first non “xx” character from the current cursor position, leaving cursor pointing to non “xx” character. ***Syntax = E7xx*** (xx stands for the hex value for an ASCII code, see ASCII Conversion Chart (Code Page 1252), page A-4.)

### *Miscellaneous Commands*

FB Suppress all occurrences of up to 15 different characters, starting at the current cursor position, as the cursor is advanced by other commands. When the FC command is encountered, the suppress function is terminated. The cursor is not moved by the FB command. ***Syntax = FBnnxxyy . .zz*** where nn is a count of the number of suppressed characters in the list and xxyy .. zz is the list of characters to be suppressed. (xx stands for the hex value for an ASCII code, see ASCII Conversion Chart (Code Page 1252), page A-4.)

FC Disables suppress filter and clear all suppressed characters. ***Syntax = FC.***

E4 Replaces up to 15 characters in the data string with user specified characters. Replacement continues until the E5 command is encountered. ***Syntax = E4nn*** $xx_1xx_2yy_1yy_2...zz_1zz_2$ where nn is the total count of both characters to be replaced plus replacement characters; $xx_1$ defines charac-

ters to be replaced and $xx_2$ defines replacement characters, continuing through $zz_1$ and $zz_2$.

E5 Terminates character replacement. ***Syntax = E5***.

FE Compare character in current cursor position to the character "xx." If characters are equal, increment cursor. If characters are not equal, no format match. ***Syntax = FExx*** (xx stands for the hex value for an ASCII code, see ASCII Conversion Chart (Code Page 1252), page A-4.)

EC Check to make sure there is an ASCII number at the current cursor position. If character is not numeric, format is aborted. ***Syntax = EC***.

ED Check to make sure there is a non-numeric ASCII character at the current cursor position. If character is numeric, format is aborted. ***Syntax = ED***.

## *Data Format Editor*

Enter Data Format

* Default Data Format

Clear One Data Format

Clear All Data Formats

Save

Discard

## *Data Formatter*

When Data Formatter is turned off, the barcode data is output to the host as read (including prefixes and suffixes). Choose one of the following options. *Default = Data Formatter On, but Not Required.*

* Data Formatter On,
but Not Required

Data Formatter Off

When Data Formatter is required, all input data must conform to an edited format or the imager does not transmit the input data to the host device.

Data Format On, Format Required

### *Alternate Data Formats*

Alternate formats allow you “single shot” capability to scan one barcode using a different data format than your primary format. When data formats are programmed (see page 5-1), you must input whether you are programming the primary format, or an alternate format numbered 1, 2, or 3.

An alternate format is initiated by scanning one of the 3 alternate format barcodes below. The imager will scan the next barcode, formatting the data with the selected alternate format, then revert immediately to the primary format.

Alternate Data Format 1

Alternate Data Format 2

Alternate Data Format 3

6

# Secondary Interface

By switching secondary interface cables, the imager can, for example, communicate with a portable data terminal (secondary interface) in addition to the host terminal (primary interface). Refer to the table below for interfaces supported by your model. Some features don't apply if the interface is not supported by your model.

## Imager Models

| Models | Primary | Secondary |
|---|---|---|
| 4600gXX03XX<br>4800iXX03XX | True RS-232 | True RS-232 |
| 4600gXX05XX<br>4800iXX05XX | Keyboard wedge, TTL level 232, TTL level 232 serial wedge, IBM 4683, wand emulation, USB keyboard, USB HID, USB retail (IBM SurePOS), USB COM port emulation | Wand Emulation, TTL level 232 |
| 4600rXX05XX | Keyboard wedge, TTL level 232, TTL level 232 serial wedge, IBM 4683, USB keyboard, USB HID, USB retail (IBM SurePOS), USB COM port emulation | TTL level 232 |
| 4600rpXX05XX | Keyboard wedge, TTL level 232, TTL level 232 serial wedge, IBM 4683, USB keyboard, USB HID, USB retail (IBM SurePOS), USB COM port emulation | TTL level 232 |

The secondary interface can be programmed at any time.

You can temporarily disable the secondary interface, but still retain the secondary interface settings in the imager's memory by scanning the **Disable** barcode below. To re-enable the secondary interface, scan the Enable barcode. *Default =Disable*.

* Disable

Enable

## *Secondary RS-232 Connection*

All communication parameters between the imager and terminal must match for correct data transfer through the serial port using RS-232 protocol.

RS-232 programmable selections are used by both the primary and secondary interfaces. Changing an RS-232 parameter (e.g., baud rate or parity), while in primary *or* secondary mode will affect both interfaces. If you want to change the RS-232 settings, refer to RS-232 Baud Rate, page 2-10.

RS-232 Interface

## *Secondary Code 39 Wand Emulation*

*Note: See "Imager Models" on page 6-1 to determine which interfaces apply to your imager.*

In Wand Emulation mode, the imager decodes the barcode then sends data in the same format as a wand imager. The Code 39 Format converts all symbologies to Code 39. The Same Code Format transmits UPC, EAN, Code 128, Codabar, and Interleaved 2 of 5 without any changes, but converts all other symbologies to Code 39. 2D symbologies are converted to Code 128. These codes set the transmission rate to 25 inches per second and the output polarity to black, high. *Default = Code 39 Format.*

The **Code 39 Format** barcode below sets the terminal ID to 61, and the **Same Code Format** barcode sets the terminal ID to 64.

Wand Emulation
Same Code Format

Wand Emulation
Code 39 Format

# *Wand Emulation Multi Block*

*Note: See "Imager Models" on page 6-1 to determine which interfaces apply to your imager.*

*Note: Changing secondary wand emulation settings also changes the primary wand emulation settings (see Wand Emulation on page 2-13).*

## *Delay Between Blocks*

This sets the delay time between data blocks. *Default = 50ms.*

5ms

* 50ms

150ms

500ms

### *Overall Checksum*

When this option is turned on, a computed check character is added at the end of the entire message. The check character is the character which when Exclusive-OR'd with every preceding character of the message yields a result of 0x00 (00H). *Default = Off.*

On

* Off

### *Wand Emulation Transmission Rate*

The transmission rate is limited by the terminal's ability to receive data without dropping characters. *Default = 25 inches/second.*

10

* 25

40

80

120

150

200

### *Wand Emulation Polarity*

The polarity can be sent as standard with black bars high, or reversed with white bars high. *Default = Black High.*

* Black High

White High

### *Wand Emulation Idle*

The idle describes the state of the imager when no data is being transmitted. When in Wand Emulation mode, you must set the imager's idle state to match the idle state for the device to which the imager is connected. *Default = Idle High*.

* Idle High

Idle Low

### *Data Block Size*

This transmits the data in smaller blocks to prevent buffer overflow. *Default = 40.*

20

* 40

60

80

# Secondary Trigger Mode

## Manual/Serial Trigger

You can activate the imager either by pressing the trigger, or using a serial trigger command (see Trigger Commands on page 12-4). When in manual trigger mode, the imager scans until a barcode is read, or until the trigger is released.

When in serial mode, the imager scans until a barcode has been read or until the deactivate command is sent. The imager can also be set to turn itself off after a specified time has elapsed (see Read Time-Out, which follows).

* Manual/Serial Trigger

## Read Time-Out

Use this selection to set a time-out (in milliseconds) of the imager's trigger when using serial commands to trigger the imager, or if the imager is in manual trigger mode. Once the imager has timed out, you can activate the imager either by pressing the trigger or using a serial trigger command. After scanning the **Read Time-Out** barcode, set the time-out duration (from 0-300,000 milliseconds) by scanning digits from the inside back cover, then scanning **Save**. *Default = 30,000.*

Read Time-Out

*Note: Programming Read Time-Out in the secondary interface also programs it in the primary interface.*

## Manual Trigger, Low Power

When using Manual Trigger, Low Power, the imager powers down until the trigger is pulled. When the trigger is pulled, the imager powers up and operates until there is no triggering for the time set with the **Low Power Time-Out** barcode below. There is a delay of up to one second in operation when the imager is first triggered, but there is no delay when operating in low power time-out mode.

Manual Trigger, Low Power

*Note:* ***Manual Trigger, Low Power*** *cannot be used with keyboard wedge applications.*

### *Low Power Time-Out Timer*

Scan the **Low Power Time-Out** barcode to change the time-out duration (in seconds). Then scan the time-out duration (from 0-300 seconds) from the inside back cover, and **Save**. *Default = 120 seconds.*

If the unit remains idle during the low power time-out interval, the unit goes into low power mode. Whenever the trigger is enabled, the low power time-out timer is reset.

Low Power Time-Out

*Note: This time-out does not begin until the imager time-out setting has expired.*

*Programming Low Power Time-Out in the secondary interface also programs it in the primary interface.*

## *Hands Free Time-Out*

The Automatic Trigger and Presentation Modes are referred to as "hands free" modes. If the imager's trigger is pulled when using a hands free mode, the imager changes to manual trigger mode. You can set the time the imager should remain in manual trigger mode by setting the Hands Free Time-Out. Once the time-out value is reached, (if there have been no further trigger pulls) the imager reverts to the original hands free mode.

*Note: If you change the time-out duration for the secondary interface, the duration of the primary interface will also be changed.*

Scan the **Hands Free Time-Out** barcode, then scan the time-out duration (from 0-300,000 milliseconds) from the inside back cover, and **Save**. *Default = 5,000 ms.*

Hands Free Time-Out

## *Scan Stand Mode*

When a unit is in Scan Stand mode, it remains idle as long as it sees the Scan Stand symbol. (See **Scan Stand Symbol** that follows.) When a different code is presented, the Imager is triggered to read the new code.

*Note: The imager automatically adjusts the illumination LEDs to the lowest light level possible to maintain a good lock on the Scan Stand symbol. When a symbol is presented, the imager's light levels adjust to the saved setting (see LED Power Level on page 3-10).*

Scan Stand Mode

### *Scan Stand Symbol*

When a unit is in Scan Stand mode, the LEDs shine at the Scan Stand symbol on the base of the stand which tells it to remain idle. When the Scan Stand symbol is covered, the imager turns the LEDs on at the configured power level (Default High) and attempts to find and decode barcodes in its field of view.

Scan Stand Symbol

## *Presentation Mode*

This programs the imager to work in Presentation mode. The LEDs are either off or at the lowest power for ambient conditions until a barcode is presented to the imager. Then the LEDs turn on automatically to read the code. Presentation Mode uses ambient light to detect the barcodes. If the light level in the room is not high enough, Presentation Mode may not work properly.

Presentation Mode

# 7 Symbologies

This programming section contains the following menu selections. Refer to Chapter 12 for settings and defaults.

- All Symbologies
- Australian Post
- Aztec Code
- British Post
- Canadian Post
- China Post
- Chinese Sensible (Han Xin) Code
- Codabar
- Codablock F
- Code 11
- Code 128
- Code 16K
- Code 39
- Code 49
- Code 93
- Data Matrix
- EAN/JAN-13
- EAN/JAN-8
- GS1 Composite Codes
- GS1 DataBar Expanded
- GS1 DataBar Limited
- GS1 DataBar Omnidirectional
- ID-tag (UPU 4-State)
- Intelligent Mail Barcode
- Interleaved 2 of 5
- Japanese Post
- Kix (Netherlands) Post
- Korea Post
- Matrix 2 of 5
- MaxiCode
- MicroPDF417
- MSI
- PDF417
- Planet Code
- Plessey Code
- PosiCode A and B
- Postnet
- QR Code
- Straight 2 of 5 IATA
- Straight 2 of 5 Industrial
- TCIF Linked Code 39 (TLC39)
- Telepen
- UPC-A/EAN-13 with Extended Coupon Code
- UPC-A

## All Symbologies

If you want to decode all the symbologies allowable for your imager, scan the **All Symbologies On** code. If on the other hand, you want to decode only a particular symbology, scan **All Symbologies Off** followed by the On symbol for that particular symbology.

All Symbologies On

All Symbologies Off

## Message Length Description

You are able to set the valid reading length of some of the barcode symbologies. If the data length of the scanned barcode doesn't match the valid reading length, the imager will issue an error beep. You may wish to set the same value for minimum and maximum length to force the imager to read fixed length barcode data. This helps reduce the chances of a misread.

**EXAMPLE:** Decode only those barcodes with a count of 9-20 characters.
Min. length = 09 Max. length = 20

**EXAMPLE:** Decode only those barcodes with a count of 15 characters.
Min. length = 15 Max. length = 15

For a value other than the minimum and maximum message length defaults, scan the barcodes included in the explanation of the symbology, then scan the digit value of the message length and **Save** barcodes on the Programming Chart inside the back cover of this manual. The minimum and maximum lengths and the defaults are included with the respective symbologies.

## Codabar

*<Default All Codabar Settings>*

### Codabar

* On

Off

### Codabar Start/Stop Characters

Start/Stop characters identify the leading and trailing ends of the barcode. You may either transmit, or not transmit Start/Stop characters.
*Default = Don't Transmit*.

Transmit

* Don't Transmit

### Codabar Check Character

Codabar check characters are created using different "modulos." You can program the imager to read only Codabar barcodes with Modulo 16 check characters. *Default = No Check Character.*

**No Check Character** indicates that the imager reads and transmits barcode data with or without a check character.

When Check Character is set to **Validate and Transmit**, the imager will only read Codabar barcodes printed with a check character, and will transmit this character at the end of the scanned data.

When Check Character is set to **Validate, but Don't Transmit**, the unit will only read Codabar barcodes printed ***with*** a check character, but will not transmit the check character with the scanned data.

* No Check Character

Validate Modulo 16, but Don't Transmit

Validate Modulo 16 and Transmit

### *Codabar Concatenation*

Codabar supports symbol concatenation. When you enable concatenation, the imager looks for a Codabar symbol having a "D" start character, adjacent to a symbol having a "D" stop character. In this case the two messages are concatenated into one with the "D" characters omitted.

Character Start Stop Start Stop

**Codabar**

A12D D34A

Select **Require** to prevent the imager from decoding a single "D" Codabar symbol without its companion. This selection has no effect on Codabar symbols without Stop/Start D characters.

On

* Off

Require

### *Codabar Message Length*

Scan the barcodes below to change the message length. Refer to Message Length Description (page 7-2) for additional information. Minimum and Maximum lengths = 2-60. Minimum Default = 4, Maximum Default = 60.

Minimum Message Length

Maximum Message Length

## *Code 39*

*< Default All Code 39 Settings >*

### *Code 39*

* On

Off

### *Code 39 Start/Stop Characters*

Start/Stop characters identify the leading and trailing ends of the barcode. You may either transmit, or not transmit Start/Stop characters. *Default = Don't Transmit.*

Transmit

* Don't Transmit

### *Code 39 Check Character*

**No Check Character** indicates that the imager reads and transmits barcode data with or without a check character.

When Check Character is set to **Validate, but Don't Transmit**, the unit only reads Code 39 barcodes printed with a check character, but will not transmit the check character with the scanned data.

When Check Character is set to **Validate and Transmit**, the imager only reads Code 39 barcodes printed with a check character, and will transmit this character at the end of the scanned data. *Default = No Check Character.*

* No Check Character

Validate, but Don't Transmit

Validate and Transmit

### *Code 39 Message Length*

Scan the barcodes below to change the message length. Refer to Message Length Description (page 7-2) for additional information. Minimum and Maximum lengths = 0-48. Minimum Default = 0, Maximum Default = 48.

Minimum Message Length

Maximum Message Length

### *Code 39 Append*

This function allows the imager to append the data from several Code 39 barcodes together before transmitting them to the host computer. When this function is enabled, the imager stores those Code 39 barcodes that start with a space (excluding the start and stop symbols), and does not immediately transmit the data. The imager stores the data in the order in which the barcodes are read, deleting the first space from each. The imager transmits the appended data when it reads a Code 39 barcode that starts with a character other than a space. *Default = Off.*

On

* Off

## Code 32 Pharmaceutical (PARAF)

Code 32 Pharmaceutical is a form of the Code 39 symbology used by Italian pharmacies. This symbology is also known as PARAF.

*Note: Trioptic Code (page 7-32) must be turned off while scanning Code 32 Pharmaceutical codes.*

On

* Off

## Full ASCII

If Full ASCII Code 39 decoding is enabled, certain character pairs within the barcode symbol will be interpreted as a single character. For example: $V will be decoded as the ASCII character SYN, and /C will be decoded as the ASCII character #. *Default = Off.*

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NUL | %U | DLE | $P | SP | SPACE | 0 | 0 | @ | %V | P | P | ‘ | %W | p | +P |
| SOH | $A | DC1 | $Q | ! | /A | 1 | 1 | A | A | Q | Q | a | +A | q | +Q |
| STX | $B | DC2 | $R | “ | /B | 2 | 2 | B | B | R | R | b | +B | r | +R |
| ETX | $C | DC3 | $S | # | /C | 3 | 3 | C | C | S | S | c | +C | s | +S |
| EOT | $D | DC4 | $T | $ | /D | 4 | 4 | D | D | T | T | d | +D | t | +T |
| ENQ | $E | NAK | $U | % | /E | 5 | 5 | E | E | U | U | e | +E | u | +U |
| ACK | $F | SYN | $V | & | /F | 6 | 6 | F | F | V | V | f | +F | v | +V |
| BEL | $G | ETB | $W | ‘ | /G | 7 | 7 | G | G | W | W | g | +G | w | +W |
| BS | $H | CAN | $X | ( | /H | 8 | 8 | H | H | X | X | h | +H | x | +X |
| HT | $I | EM | $Y | ) | /I | 9 | 9 | I | I | Y | Y | i | +I | y | +Y |
| LF | $J | SUB | $Z | * | /J | : | /Z | J | J | Z | Z | j | +J | z | +Z |
| VT | $K | ESC | %A | + | /K | ; | %F | K | K | [ | %K | k | +K | { | %P |
| FF | $L | FS | %B | , | /L | < | %G | L | L | \ | %L | l | +L | \| | %Q |
| CR | $M | GS | %C | - | - | = | %H | M | M | ] | %M | m | +M | } | %R |
| SO | $N | RS | %D | . | . | > | %I | N | N | ^ | %N | n | +N | ~ | %S |
| SI | $O | US | %E | / | /O | ? | %J | O | O | _ | %O | o | +O | DEL | %T |

Character pairs /M and /N decode as a minus sign and period respectively. Character pairs /P through /Y decode as 0 through 9.

Full ASCII On

* Full ASCII Off

### Code 39 Code Page

Code pages define the mapping of character codes to characters. If the data received does not display with the proper characters, it may be because the barcode being scanned was created using a code page that is different from the one the host program is expecting. If this is the case, scan the barcode below, select the code page with which the barcodes were created (see Code Page Mapping of Printed Barcodes on page A-6), and scan the value and the **Save** barcode from the Programming Chart on the inside the back cover of this manual. The data characters should then appear properly.

Code 39 Code Page

## Interleaved 2 of 5

*< Default All Interleaved 2 of 5 Settings >*

### Interleaved 2 of 5

* On

Off

### Check Digit

**No Check Digit** indicates that the imager reads and transmits barcode data with or without a check digit.

When Check Digit is set to **Validate, but Don't Transmit**, the unit only reads Interleaved 2 of 5 barcodes printed with a check digit, but will not transmit the check digit with the scanned data.

When Check Digit is set to **Validate and Transmit**, the imager only reads Interleaved 2 of 5 barcodes printed with a check digit, and will transmit this digit at the end of the scanned data. *Default = No Check Digit.*

* No Check Digit

Validate, but Don't Transmit

Validate and Transmit

### *Interleaved 2 of 5 Message Length*

Scan the barcodes below to change the message length. Refer to Message Length Description (page 7-2) for additional information. Minimum and Maximum lengths = 2-80. Minimum Default = 4, Maximum Default = 80.

Minimum Message Length

Maximum Message Length

## Code 93

*< Default All Code 93 Settings >*

### Code 93

* On

Off

### Code 93 Message Length

Scan the barcodes below to change the message length. Refer to Message Length Description (page 7-2) for additional information. Minimum and Maximum lengths = 0-80. Minimum Default = 0, Maximum Default = 80.

Minimum Message Length

Maximum Message Length

### Code 93 Code Page

Code pages define the mapping of character codes to characters. If the data received does not display with the proper characters, it may be because the barcode being scanned was created using a code page that is different from the one the host program is expecting. If this is the case, scan the barcode below, select the code page with which the barcodes were created (see Code Page Mapping of Printed Barcodes on page A-6), and scan the value and the **Save** barcode from the Programming Chart on the inside the back cover of this manual. The data characters should then appear properly.

Code 93 Code Page

## *Straight 2 of 5 Industrial*

*<Default All Straight 2 of 5 Industrial Settings>*

### *Straight 2 of 5 Industrial*

On

* Off

### *Straight 2 of 5 Industrial Message Length*

Scan the barcodes below to change the message length. Refer to Message Length Description (page 7-2) for additional information. Minimum and Maximum lengths = 1-48. Minimum Default = 4, Maximum Default = 48.

Minimum Message Length

Maximum Message Length

## *Straight 2 of 5 IATA (Two-Bar Start/Stop)*

*<Default All Straight 2 of 5 IATA Settings>*

### *Straight 2 of 5 IATA*

On

* Off

### *Straight 2 of 5 IATA Message Length*

Scan the barcodes below to change the message length. Refer to Message Length Description (page 7-2) for additional information. Minimum and Maximum lengths = 1-48. Minimum Default = 4, Maximum Default = 48.

Minimum Message Length

Maximum Message Length

# Matrix 2 of 5

*<Default All Matrix 2 of 5 Settings>*

### Matrix 2 of 5

On

* Off

### Matrix 2 of 5 Message Length

Scan the barcodes below to change the message length. Refer to Message Length Description (page 7-2) for additional information. Minimum and Maximum lengths = 1-80. Minimum Default = 4, Maximum Default = 80.

Minimum Message Length

Maximum Message Length

# Code 11

*<Default All Code 11 Settings>*

## *Code 11*

On

* Off

## *Check Digits Required*

This option sets whether 1 or 2 check digits are required with Code 11 barcodes. *Default = Two Check Digits.*

One Check Digit

* Two Check Digits

## *Code 11 Message Length*

Scan the barcodes below to change the message length. Refer to Message Length Description (page 7-2) for additional information. Minimum and Maximum lengths = 1-80. Minimum Default = 4, Maximum Default = 80.

Minimum Message Length

Maximum Message Length

# Code 128

*<Default All Code 128 Settings>*

### Code 128

*  On

Off

### ISBT 128 Concatenation

In 1994 the International Society of Blood Transfusion (ISBT) ratified a standard for communicating critical blood information in a uniform manner.  The use of ISBT formats requires a paid license. The ISBT 128 Application Specification describes 1) the critical data elements for labeling blood products, 2) the current recommendation to use Code 128 due to its high degree of security and its space-efficient design, 3) a variation of Code 128 that supports concatenation of neighboring symbols, and 4) the standard layout for barcodes on a blood product label.  Use the barcodes below to turn concatenation on or off.  *Default =Off.*

On

*  Off

### *Code 128 Message Length*

Scan the barcodes below to change the message length. Refer to Message Length Description (page 7-2) for additional information. Minimum and Maximum lengths = 0-80. Minimum Default = 0, Maximum Default = 80.

Minimum Message Length

Maximum Message Length

### *Code 128 Code Page*

Code pages define the mapping of character codes to characters. If the data received does not display with the proper characters, it may be because the barcode being scanned was created using a code page that is different from the one the host program is expecting. If this is the case, scan the barcode below, select the code page with which the barcodes were created (see Code Page Mapping of Printed Barcodes on page A-6), and scan the value and the **Save** barcode from the Programming Chart on the inside the back cover of this manual. The data characters should then appear properly.

Code 128 Code Page

## Telepen

*<Default All Telepen Settings>*

### Telepen

On

* Off

### Telepen Output

Using **AIM Telepen Output**, the imager reads symbols with start/stop pattern 1 and decodes them as standard full ASCII (start/stop pattern 1). When **Original Telepen Output** is selected, the imager reads symbols with start/stop pattern 1 and decodes them as compressed numeric with optional full ASCII (start/stop pattern 2). *Default = AIM Telepen Output.*

* AIM Telepen Output

Original Telepen Output

### Telepen Message Length

Scan the barcodes below to change the message length. Refer to Message Length Description (page 7-2) for additional information. Minimum and Maximum lengths = 1-60. Minimum Default = 1, Maximum Default = 60.

Minimum Message Length

Maximum Message Length

# UPC-A

*<Default All UPC-A Settings>*

## UPC-A

* On

Off

## UPC-A Check Digit

This selection allows you to specify whether the check digit should be transmitted at the end of the scanned data or not. *Default = On*.

* On

Off

## UPC-A Number System

The numeric system digit of a UPC symbol is normally transmitted at the beginning of the scanned data, but the unit can be programmed so it will not transmit it. *Default = On.*

* On

Off

### *UPC-A Addenda*

This selection adds 2 or 5 digits to the end of all scanned UPC-A data.
*Default = Off for both 2 Digit and 5 Digit Addenda.*

2 Digit Addenda On

* 2 Digit Addenda Off

5 Digit Addenda On

* 5 Digit Addenda Off

### *UPC-A Addenda Required*

When **Required** is scanned, the imager will only read UPC-A barcodes that have addenda. You must then turn on a 2 or 5 digit addenda listed on page 7-19. *Default = Not Required.*

Required

* Not Required

### *UPC-A Addenda Separator*

When this feature is on, there is a space between the data from the barcode and the data from the addenda. When turned off, there is no space.
*Default = On.*

* On

Off

# UPC-A/EAN-13 with Extended Coupon Code

Use the following codes to enable or disable UPC-A **and** EAN-13 with Extended Coupon Code. When left on the default setting (**Off**), the imager treats Coupon Codes and Extended Coupon Codes as single barcodes.

If you scan the **Allow Concatenation** code, when the imager sees the coupon code and the extended coupon code in a single scan, it transmits both as separate symbologies. Otherwise, it transmits the first coupon code it reads.

If you scan the **Require Concatenation** code, the imager must see and read the coupon code and extended coupon code in a single read to transmit the data. No data is output unless both codes are read.

*Default = Off.*

* Off

Allow Concatenation

Require Concatenation

# UPC-E0

*<Default All UPC-E Settings>*

## UPC-E0

Most UPC barcodes lead with the 0 number system. To read these codes, use the **UPC-E0 On** selection. If you need to read codes that lead with the 1 number system, use UPC-E1 (page 7-22). *Default = On.*

* UPC-E0 On

UPC-E0 Off

## *UPC-E0 Expand*

UPC-E Expand expands the UPC-E code to the 12 digit, UPC-A format.
*Default = Off.*

On

* Off

## *UPC-E0 Addenda Required*

When **Required** is scanned, the imager will only read UPC-E barcodes that have addenda. *Default = Not Required.*

Required

* Not Required

## *UPC-E0 Addenda Separator*

When this feature is **On**, there is a space between the data from the barcode and the data from the addenda. When turned **Off**, there is no space.
*Default = On.*

* On

Off

## *UPC-E0 Check Digit*

Check Digit specifies whether the check digit should be transmitted at the end of the scanned data or not. *Default = On.*

* On

Off

### *UPC-E0 Number System*

The numeric system digit of a UPC symbol is normally transmitted at the beginning of the scanned data, but the unit can be programmed so it will not transmit it. To prevent transmission, scan **Off**. *Default = On.*

* On

Off

### *UPC-E0 Addenda*

This selection adds 2 or 5 digits to the end of all scanned UPC-E data.
*Default = Off for both 2 Digit and 5 Digit Addenda.*

2 Digit Addenda On

* 2 Digit Addenda Off

5 Digit Addenda On

* 5 Digit Addenda Off

## *UPC-E1*

Most UPC barcodes lead with the 0 number system. For these codes, use UPC-E0 (page 7-20). If you need to read codes that lead with the 1 number system, use the **UPC-E1 On** selection. *Default = Off.*

UPC-E1 On

* UPC-E1 Off

# EAN/JAN-13

*<Default All EAN/JAN Settings>*

### EAN/JAN-13

* On

Off

### EAN/JAN-13 Check Digit

This selection allows you to specify whether the check digit should be transmitted at the end of the scanned data or not. *Default = On.*

* On

Off

## *EAN/JAN-13 Addenda*

This selection adds 2 or 5 digits to the end of all scanned EAN/JAN-13 data.
*Default = Off for both 2 Digit and 5 Digit Addenda.*

2 Digit Addenda On

* 2 Digit Addenda Off

5 Digit Addenda On

* 5 Digit Addenda Off

## *EAN/JAN-13 Addenda Required*

When **Required** is scanned, the imager will only read EAN/JAN-13 barcodes that have addenda. *Default = Not Required.*

Required

* Not Required

## *EAN/JAN-13 Addenda Separator*

When this feature is **On**, there is a space between the data from the barcode and the data from the addenda. When turned **Off**, there is no space.
*Default = On.*

* On

Off

*Note: If you want to enable or disable EAN13 with Extended Coupon Code, refer to UPC-A/EAN-13 with Extended Coupon Code (page 7-20).*

### ISBN Translate

When **On** is scanned, EAN-13 Bookland symbols are translated into their equivalent ISBN number format. *Default = Off.*

On

* Off

## EAN/JAN-8

*<Default All EAN/JAN-8 Settings>*

### EAN/JAN-8

* On

Off

### EAN/JAN-8 Check Digit

This selection allows you to specify whether the check digit should be transmitted at the end of the scanned data or not. *Default = On.*

* On

Off

### *EAN/JAN-8 Addenda*

This selection adds 2 or 5 digits to the end of all scanned EAN/JAN-8 data.
*Default = Off for both 2 Digit and 5 Digit Addenda.*

2 Digit Addenda On

* 2 Digit Addenda Off

5 Digit Addenda On

* 5 Digit Addenda Off

### *EAN/JAN-8 Addenda Required*

When **Required** is scanned, the imager will only read EAN/JAN-8 barcodes that have addenda. *Default = Not Required.*

Required

* Not Required

### *EAN/JAN-8 Addenda Separator*

When this feature is **On**, there is a space between the data from the barcode and the data from the addenda. When turned **Off**, there is no space.
*Default = On.*

* On

Off

## MSI

<Default All MSI Settings>

### MSI

On

* Off

### MSI Check Character

Different types of check characters are used with MSI barcodes. You can program the imager to read MSI barcodes with Type 10 check characters. *Default = Validate Type 10, but Don't Transmit.*

When Check Character is set to **Validate Type 10 and Transmit**, the imager will only read MSI barcodes printed with the specified type check character, and will transmit this character at the end of the scanned data.

When Check Character is set to **Validate Type 10, but Don't Transmit**, the unit will only read MSI barcodes printed with the specified type check character, but will not transmit the check character with the scanned data.

* Validate Type 10, but Don't Transmit

Validate Type 10 and Transmit

### MSI Message Length

Scan the barcodes below to change the message length. Refer to Message Length Description (page 7-2) for additional information. Minimum and Maximum lengths = 4-48. Minimum Default = 4, Maximum Default = 48.

Minimum Message Length

Maximum Message Length

## Plessey Code

*<Default All Plessey Code Settings>*

### Plessey Code

On

* Off

### Plessey Message Length

Scan the barcodes below to change the message length. Refer to Message Length Description (page 7-2) for additional information. Minimum and Maximum lengths = 4-48. Minimum Default = 4, Maximum Default = 48.

Minimum Message Length

Maximum Message Length

## GS1 DataBar Omnidirectional

*< Default All GS1 DataBar Omnidirectional Settings >*

**GS1 DataBar Omnidirectional**

* On

Off

## GS1 DataBar Limited

*< Default All GS1 DataBar Limited Settings >*

**GS1 DataBar Limited**

* On

Off

## GS1 DataBar Expanded

*< Default All GS1 DataBar Expanded Settings >*

## GS1 DataBar Expanded

* On

Off

## GS1 DataBar Expanded Message Length

Scan the barcodes below to change the message length. Refer to Message Length Description (page 7-2) for additional information. Minimum and Maximum lengths = 4-74. Minimum Default = 4, Maximum Default = 74.

Minimum Message Length

Maximum Message Length

## PosiCode

*<Default All PosiCode Settings>*

### PosiCode A and B

* On

Off

You have to have PosiCode A and B on to read any of the PosiCode symbologies.

A and B On
(No Limited)

A and B and Limited A On
(Limited B Off)

* A and B and Limited B On
(Limited A Off)

### PosiCode Message Length

Scan the barcodes below to change the message length. Refer to Message Length Description (page 7-2) for additional information. Minimum and Maximum lengths = 2-80. Minimum Default = 4, Maximum Default = 48.

Minimum Message Length

Maximum Message Length

## Trioptic Code

*Note: If you are going to scan Code 32 Pharmaceutical codes (page 7-7), Trioptic Code must be off.*

Trioptic Code is used for labeling magnetic storage media.

On

* Off

## Codablock F

*<Default All Codablock F Settings>*

### Codablock F

On

* Off

### Codablock F Message Length

Scan the barcodes below to change the message length. Refer to Message Length Description (page 7-2) for additional information. Minimum and Maximum lengths = 1-2048. Minimum Default = 1, Maximum Default = 2048.

Minimum Message Length

Maximum Message Length

## Code 16K

*<Default All Code 16K Settings>*

### Code 16K

On

* Off

### Code 16K Message Length

Scan the barcodes below to change the message length. Refer to Message Length Description (page 7-2) for additional information. Minimum and Maximum lengths = 0-160. Minimum Default = 1, Maximum Default = 160.

Minimum Message Length

Maximum Message Length

# Code 49

*<Default All Code 49 Settings>*

### Code 49

* On

Off

### Code 49 Message Length

Scan the barcodes below to change the message length. Refer to Message Length Description (page 7-2) for additional information. Minimum and Maximum lengths = 1-81. Minimum Default = 1, Maximum Default = 81.

Minimum Message Length

Maximum Message Length

## PDF417

*< Default All PDF417 Settings >*

### PDF417

* On

Off

### PDF417 Message Length

Scan the barcodes below to change the message length. Refer to Message Length Description (page 7-2) for additional information. Minimum and Maximum lengths = 1-2750. Minimum Default = 1, Maximum Default = 2750.

Minimum Message Length

Maximum Message Length

# MicroPDF417

< Default All MicroPDF417 Settings >

### MicroPDF417

On

* Off

### MicroPDF417 Message Length

Scan the barcodes below to change the message length. Refer to Message Length Description (page 7-2) for additional information. Minimum and Maximum lengths = 1-366. Minimum Default = 1, Maximum Default = 366.

Minimum Message Length

Maximum Message Length

# GS1 Composite Codes

Linear codes are combined with a unique 2D composite component to form a new class called GS1 Composite symbology. GS1 Composite symbologies allow for the co-existence of symbologies already in use.

On

* Off

### *UPC/EAN Version*

Scan the **UPC/EAN Version On** barcode to decode GS1 Composite symbols that have a UPC or EAN linear component. (This does not affect GS1 Composite symbols with a UCC/EAN-128 or GS1 linear component. If either of these codes are the linear component, either Code 128 or the correct GS1 code must be enabled.)

UPC/EAN Version On

* UPC/EAN Version Off

### *GS1 Composite Code Message Length*

Scan the barcodes below to change the message length. Refer to Message Length Description (page 7-2) for additional information. Minimum and Maximum lengths = 1-2435. Minimum Default = 1, Maximum Default = 2435.

Minimum Message Length

Maximum Message Length

## *GS1 Emulation*

The imager can automatically format the output from any GS1 data carrier to emulate what would be encoded in an equivalent GS1-128 or GS1 DataBar symbol. GS1 data carriers include UPC-A and UPC-E, EAN-13 and EAN-8, ITF-14, GS1-128, and GS1-128 DataBar and GS1 Composites. (Any application that accepts GS1 data can be simplified since it only needs to recognize one data carrier type.)

If **GS1-128 Emulation** is scanned, all retail codes (UPC, UPC-E, EAN8, EAN13) are expanded out to 16 digits. If the AIM ID is enabled, the value will be the GS1-128 AIM ID, ]C1 (see Symbology Chart on page A-1).

If **GS1 DataBar Emulation** is scanned, all retail codes (UPC, UPC-E, EAN8, EAN13) are expanded out to 16 digits. If the AIM ID is enabled, the value will be the GS1-DataBar AIM ID, ]e*m* (see Symbology Chart on page A-1).

If **GS1 Code Expansion Off** is scanned, retail code expansion is disabled, and UPC-E expansion is controlled by the UPC-E0 Expand (page 7-21) setting. If the AIM ID is enabled, the value will be the GS1-128 AIM ID, ]C1 (see Symbology Chart on page A-1).

*Default = GS1 Emulation Off.*

GS1-128 Emulation

GS1 DataBar Emulation

GS1 Code Expansion Off

* GS1 Emulation Off

## TCIF Linked Code 39 (TLC39)

This code is a composite code since it has a Code 39 linear component and a MicroPDF417 stacked code component. All barcode readers are capable of reading the Code 39 linear component. The MicroPDF417 component can only be decoded if **TLC39 On** is selected. The linear component may be decoded as Code 39 even if TLC39 is off. *Default = Off.*

On

* Off

## Postal Codes

*Note: For best performance when reading a postal symbology, all other postal symbologies should be turned off.*

### Intelligent Mail Barcode

*Note: You may enable the Intelligent Mail Barcode if you have firmware with a base number of 31205480.* *Refer to the Show Software Revision on page 11-2 for information on determining the firmware revision in your unit.*

On

* Off

### *ID-tag (UPU 4-State)*

*Note: You may enable the ID-tag (UPU 4-State) if you have firmware with a base number of 31205480. Refer to the Show Software Revision on page 11-2 for information on determining the firmware revision in your unit.*

On

* Off

### *Postnet*

On

* Off

### *Postnet Check Digit*

This selection allows you to specify whether the check digit should be transmitted at the end of the scanned data.

Transmit Check Digit

* Don’t Transmit Check Digit

## *Planet Code*

On

* Off

## *Planet Code Check Digit*

This selection allows you to specify whether the check digit should be transmitted at the end of the scanned data.

Transmit Check Digit

* Don't Transmit Check Digit

### *British Post*

On

* Off

### *Canadian Post*

On

* Off

### *Kix (Netherlands) Post*

*Note: Kix code can misread when scanned sideways or upside down. Use Working Orientation, page 3-22, if your Kix codes will not usually be presented upright to the imager.*

On

* Off

### *Australian Post*

On

* Off

## *Australian Post Interpretation*

This option controls what interpretation is applied to customer fields in Australian 4-State symbols.

**Bar Output** lists the bar patterns in “0123” format.

**Numeric N Table** causes that field to be interpreted as numeric data using the N Table.

**Alphanumeric C Table** causes the field to be interpreted as alphanumeric data using the C Table.  Refer to the Australian Post Specification Tables.

*Note: You may enable the Australian Post Interpretation option if you have firmware with a base number of 31205480.   Refer to the Show Software Revision on page 11-2 for information on determining the firmware revision in your unit.*

* Bar Output

Numeric N Table

Alphanumeric C Table

### *Japanese Post*

On

* Off

### *China Post*

*<Default All China Post Settings>*

### *China Post*

On

* Off

### *China Post Message Length*

Scan the barcodes below to change the message length. Refer to Message Length Description (page 7-2) for additional information. Minimum and Maximum lengths = 2-80. Minimum Default = 4, Maximum Default = 80.

Minimum Message Length

Maximum Message Length

## *Korea Post*

*<Default All Korea Post Settings>*

## *Korea Post*

On

* Off

## *Korea Post Message Length*

Scan the barcodes below to change the message length. Refer to Message Length Description (page 7-2) for additional information. Minimum and Maximum lengths = 2-80. Minimum Default = 4, Maximum Default = 48.

Minimum Message Length

Maximum Message Length

## QR Code

*< Default All QR Code Settings >*

### QR Code

This selection applies to both QR Code and Micro QR Code.

* On

Off

*Note: The default applies to firmware with a base number of 31205480. Refer to the Show Software Revision on page 11-2 for information on determining the firmware revision in your unit*

### QR Code Message Length

Scan the barcodes below to change the message length. Refer to Message Length Description (page 7-2) for additional information. Minimum and Maximum lengths = 1-7089. Minimum Default = 1, Maximum Default = 7089.

Minimum Message Length

Maximum Message Length

# Data Matrix

*< Default All Data Matrix Settings >*

### Data Matrix

* On

Off

### Data Matrix Message Length

Scan the barcodes below to change the message length. Refer to Message Length Description (page 7-2) for additional information. Minimum and Maximum lengths = 1-3116. Minimum Default = 1, Maximum Default = 3116.

Minimum Message Length

Maximum Message Length

# MaxiCode

*< Default All MaxiCode Settings >*

### MaxiCode

*** On**

Off

### MaxiCode Message Length

Scan the barcodes below to change the message length. Refer to Message Length Description (page 7-2) for additional information. Minimum and Maximum lengths = 1-150. Minimum Default = 1, Maximum Default = 150.

Minimum Message Length

Maximum Message Length

## Aztec Code

*< Default All Aztec Code Settings >*

### Aztec Code

* On

Off

### Aztec Code Message Length

Scan the barcodes below to change the message length. Refer to Message Length Description (page 7-2) for additional information. Minimum and Maximum lengths = 1-3832. Minimum Default = 1, Maximum Default = 3832.

Minimum Message Length

Maximum Message Length

### Aztec Runes

Select **Enable Runes** if you are scanning Aztec runes, which are the smallest type of Aztec Code symbol with the ability to encode a very short license plate message.

Enable Runes

* Disable Runes

## Chinese Sensible (Han Xin) Code

*< Default All Han Xin Settings >*

### Han Xin Code

On

* Off

### Han Xin Code Message Length

Scan the barcodes below to change the message length. Refer to Message Length Description (page 7-2) for additional information. Minimum and Maximum lengths = 1-7833. Minimum Default = 1, Maximum Default = 7833.

Minimum Message Length

Maximum Message Length

# 8 Imaging Commands

The image scanner is like a digital camera in the way it captures, manipulates, and transfers images. The following commands allow you to alter the way the imager performs these functions.

## Single-Use Basis

Imaging Commands with their modifiers send instructions to the imager on a single-use basis, and take effect for a single image capture. Once that capture is complete, the imager reverts to its imaging default settings. If you want to permanently change a setting, you must use the serial default commands (see Chapter 12). When the serial default command is used, that selection becomes the new, permanent setting for the imager.

## Command Syntax

Multiple modifiers and commands can be issued within one sequence. If additional modifiers are to be applied to the same command, just add the modifiers to that command. For example, to add 2 modifiers to the Image Snap command, such as setting the Imaging Style to 1P and the Wait for Trigger to 1T, you would enter **IMGSNP1P1T.**

*Note: After processing an image capture command (IMGSNP or IMGBOX), you must follow it with an IMGSHP command if you want to see it on your terminal.*

To add a command to a sequence, each new command is separated with a semicolon. For example, to add the Image Ship command to the above sequence, you would enter **IMGSNP1P1T;IMGSHP.**

The imaging commands are:


Image Snap - IMGSNP (page 8-2)

Image Ship - IMGSHP (page 8-5)

Intelligent Signature Capture - IMGBOX (page 8-14)


The modifiers for each of these commands follow the command description.

*Note: The images included with each command description are examples only. The results you achieve may be different from those included in this manual. The quality of the output you receive will vary depending on lighting, quality of the initial image/object being captured, and distance of the imager from the image/object. To achieve a high quality image, it is recommended that you position your imager 4-6" (122-183 cm) away from the image/object you are capturing.*

# Step 1 - Take a Picture Using IMGSNP

## Image Snap - IMGSNP

An image is taken whenever the hardware button is pressed, or when the Image Snap (IMGSNP) command is processed.

The image snap command has many different modifiers that can be used to change the look of the image in memory. Modifiers always begin with numbers and end with a letter (case insensitive). Any number of modifiers may be appended to the IMGSNP command. For example, you can use the following command to snap an image, increase the gain, and have the beeper sound once the snap is complete:

IMGSNP2G1B

### IMGSNP Modifiers

#### P - Imaging Style

This sets the Image Snap style.

0P **Decoding Style**. This processing allows a few frames to be taken until the exposure parameters are met. The last frame is then available for further use.

1P **Photo Style** ***(default).*** This mimics a simple digital camera, and results in a visually optimized image.

2P **Manual Style**. This is an advanced style that should only be used by an experienced user. It allows you the most freedom to set up the imager, and has no auto-exposure.

#### B - Beeper

Causes a beep to sound after an image is snapped.

0B No beep *(default)*

1B Sounds a beep when the image is captured.

#### T - Wait for Trigger

Waits for a hardware button push before taking the image. This is only available when using Photo Style (1P).

0T Takes image immediately *(default)*

1T Waits for a button push, then takes the image

### L - LED State

Determines if the LEDs should be on or off, and when. Ambient illumination (0L) is preferred for taking pictures of color documents, such as ID cards, especially when the imager is in a stand. LED illumination (1L) is preferred when the imager is handheld. LED State is not available when using Decoding Style (0P).

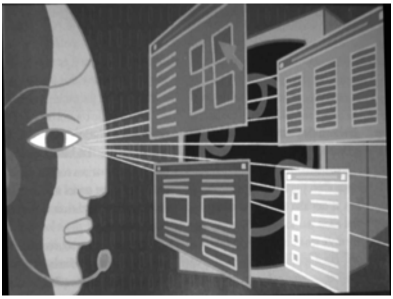
| | |
|---|---|
| 0L | LEDs off *(default)* |
| 1L | LEDs on |

### E - Exposure

Exposure is used in Manual Style only (2P), and allows you to set the exposure time. This is similar to setting a shutter speed on a camera. The exposure time determines how long the imager takes to record an image. On a bright day, exposure times can be very short because plenty of light is available to help record an image. At nighttime, exposure time can increase dramatically due to the near absence of light. Units are 127 microseconds. *(Default = 7874)*

| | |
|---|---|
| *n*E | Range: 1 - 7874 |

Example of Exposure at 7874E with fluorescent lighting:



Example of Exposure at 100E with fluorescent lighting:



## G - Gain

Gain is used in Manual Style only (2P). Like a volume control, the gain modifier boosts the signal and multiplies the pixel value. As you increase the gain, the noise in an image is also amplified.

| | |
|---|---|
| 1G | No gain *(default)* |
| 2G | Medium gain |
| 4G | Heavy gain |
| 8G | Maximum gain |

Example of Gain at 1G:



Example of Gain at 4G:



Example of Gain at 8G:



## W - Target White Value

Sets the target for the median grayscale value in the captured image. For capturing close-up images of high contrast documents, a lower setting, such as 75, is recommended. Higher settings result in longer exposure times and brighter images, but if the setting is too high, the image may be overexposed. Target White Value is only available when using Photo Style (1P). *(Default = 125)*

*n*W Range: 0 - 255

Example of White Value at 75W:



Example of White Value at 125W:



Example of White Value at 200W:



## D - Delta for Acceptance

This sets the allowable range for the white value setting (see W - Target White Value). Delta is only available when using Photo Style (1P). *(Default = 25)*

*n*D Range: 0 - 255

## U - Update Tries

This sets the maximum number of frames the imager should take to reach the D - Delta for Acceptance. Update Tries is only available when using Photo Style (1P). *(Default = 6)*

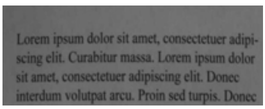
*n*U Range: 0 - 10

**% - Target Set Point Percentage**

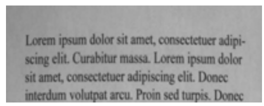
Sets the target point for the light and dark values in the captured image. A setting of 75% means 75% of the pixels are at or below the target white value, and 25% of the pixels are above the target white value. Altering this setting from the default is not recommended under normal circumstances. To alter grayscale values, W - Target White Value should be used. *(Default = 50)*

n% Range: 1 - 99

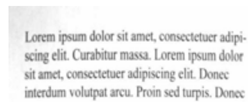
Example of Target Set Point Percentage at 97%:




Example of Target Set Point Percentage at 50%:




Example of Target Set Point Percentage at 40%:




# *Step 2 - Ship a Picture Using IMGSHP*

## *Image Ship - IMGSHP*

An image is taken whenever the button is pressed, or when the Image Snap (IMGSNP) command is processed. The last image is always stored in memory. You can “ship” the image by using the IMGSHP command.

The image ship commands have many different modifiers that can be used to change the look of the image output. Modifiers affect the image that is transmitted, but do not affect the image in memory. Modifiers always begin with a number and end with a letter (case insensitive). Any number of modifiers may be appended to the IMGSHP command. For example, you can use the following command to snap and ship a bitmap image with gamma correction and document image filtering:

**IMGSNP;IMGSHP8F75K26U**

### IMGSHP Modifiers

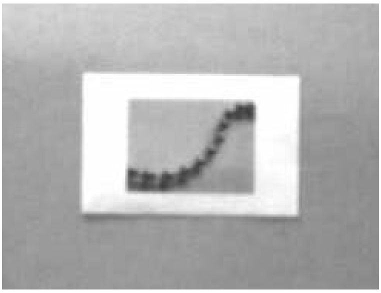
**A - Infinity Filter**

Enhances pictures taken from very long distances (greater than 10 feet or 3m). The Infinity Filter should not be used with IMGSHP Modifiers (page 8-6).

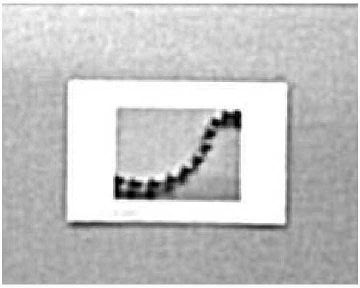
0A Infinity filter off *(default)*

1A Infinity filter on

Example of Infinity Filter off (0A) from approximately 12 feet (3.66m) away:



Example of Infinity Filter on (1A) from approximately 12 feet (3.66m) away:



**C - Compensation**

Flattens the image to account for variations in illumination across the image.

0C Compensation disabled *(default)*

1C Compensation enabled

Example of Compensation at 0C:



Example of Compensation at 1C:



**D - Pixel Depth**

Indicates the number of bits per pixel in the transmitted image (KIM or BMP format only).

8D 8 bits per pixel, grayscale image *(default)*

1D 1 bit per pixel, black and white image

**E - Edge Sharpen**

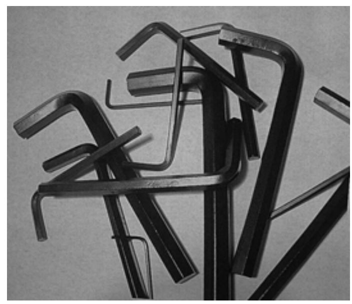
An edge sharpen filter cleans up the edges of an image, making it look cleaner and sharper. While edge sharpening does make the image look cleaner, it also removes some fine detail from the original image. The strength of the edge sharpen filter can be entered from 1 to 24. Entering a 23E gives the sharpest edges, but also increases noise in the image.

| | |
|---|---|
| 0E | Don't sharpen image *(default)* |
| 14E | Apply edge sharpen for typical image |
| *n*e | Apply edge sharpen using strength *n* (*n* = 1-24) |

Example of Edge Sharpen at 0E:



Example of Edge Sharpen at 24E:



**F - File Format**

Indicates the desired format for the image.

| | |
|---|---|
| 0F | KIM format |
| 1F | TIFF binary |
| 2F | TIFF binary group 4, compressed |
| 3F | TIFF grayscale |
| 4F | Uncompressed binary (upper left to lower right, 1 pixel/bit, 0 padded end of line) |
| 5F | Uncompressed grayscale (upper left to lower right, bitmap format) |
| 6F | JPEG image *(default)* |
| 8F | BMP format (lower right to upper left, uncompressed) |

### H - Histogram Stretch

Increases the contrast of the transmitted image. Not available with some image formats.

0H No stretch *(default)*

1H Histogram stretch

Example of Histogram Stretch at 0H:



Example of Histogram Stretch at 1H:



### I - Invert Image

Invert image is used to rotate the image around the X or Y axis.

1ix Invert around the X axis (flips picture upside down)

1iy Invert around the Y axis (flips picture left to right)

Example of image not inverted:



Example of image with Invert Image set to 1ix:



Example of image with Invert Image set to 1iy:



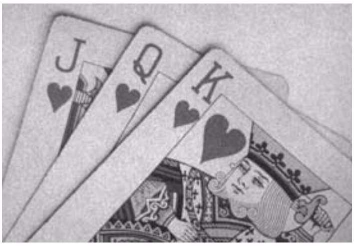
## IF- Noise Reduction

Used to reduce the salt and pepper noise in an image.

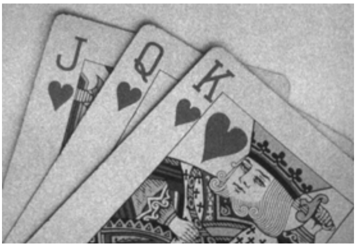
0if    No salt and pepper noise reduction (default)

1if    Salt and pepper noise reduction

Example of Noise Reduction Off (0if):



Example of Noise Reduction On (1if):



## IR - Image Rotate

0ir    Image as snapped (rightside up) (default)

1ir    Rotate image 90 degrees to the right

2ir    Rotate image 180 degrees (upside down)

3ir    Rotate image 90 degrees to the left

Example of Image Rotate set to 0ir:



Example of Image Rotate set to 2ir:



Example of Image Rotate set to 1ir:



Example of Image Rotate set to 3ir:



### J - JPEG Image Quality

Sets the desired quality when the JPEG image format is selected. Higher numbers result in higher quality, but larger files. Smaller numbers result in greater amounts of lossy compression, faster transmission times, lower quality, but smaller files. *(Default = 50)*

- *n*J — Image is compressed as much as possible while preserving quality factor of *n* (*n* = 0 - 100)
- 0J — worst quality (smallest file)
- 100J — best quality (largest file)

### K - Gamma Correction

Gamma measures the brightness of midtone values produced by the image. You can brighten or darken an image using gamma correction. A higher gamma correction yields an overall brighter image. The lower the setting, the darker the image. The optimal setting for text images is 50K.

- 0K — Gamma correction off *(default)*
- 50K — Apply gamma correction for brightening typical document image
- *n*K — Apply gamma correction factor *n* (*n* = 0-1,000)

Example of Gamma Correction set to 0K:




Example of Gamma Correction set to 50K:




Example of Gamma Correction set to 255K:




### L, R, T, B, M - Image Cropping

*Note: Image Cropping should not be used with IMGSHP Modifiers (see page 8-6).*

Ships a window of the image by specifying the left, right, top, and bottom pixel coordinates. Device columns are numbered 0 through 640, and device rows are numbered 0 through 480.

- *n*L — The left edge of the shipped image corresponds to column *n* of the image in memory. Range: 000 - 640. *(Default = 0)*
- *n*R — The right edge of the shipped image corresponds to column *n* - 1 of the image in memory. Range: 000 - 640. *(Default = all columns)*
- *n*T — The top edge of the shipped image corresponds to row *n* of the image in memory. Range: 000 - 480. *(Default = 0)*

*n*B The bottom edge of the shipped image corresponds to row *n* - 1 of the image in memory. Range: 000 - 480. *(Default = all rows)*

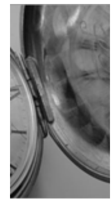
Uncropped Image:



Example of Image Crop set to 300R:



Example of Image Crop set to 300L:



Example of Image Crop set to 200B:



Example of Image Crop set to 200T:



Alternately, specify the number of pixels to cut from the outside margin of the image; thus only the center pixels are transmitted.

*n*M Margin: cut *n* columns from the left, *n* + 1 columns from the right, *n* rows from the top, and *n* + 1 rows from the bottom of the image. Ship the remaining center pixels. Range: 0 - 238. *(Default = 0, or full image)*

Example of Image Crop set to 238M:



**P - Protocol**

Used for shipping an image. Protocol covers two features of the image data being sent to the host. It addresses the protocol used to send the data (Hmodem, which is an Xmodem 1K variant that has additional header information), and the format of the image data that is sent.

0P None (raw data)

2P None *(default for USB)*

3P Hmodem compressed *(default for RS-232)*

4P Hmodem

### S - Pixel Ship

Pixel Ship sizes an image in proportion to its original size. It decimates the image by shipping only certain, regularly spaced pixels. For example, **4S** would transmit every fourth pixel from every fourth line. The smaller number of pixels shipped, the smaller the image, however, after a certain point the image becomes unusable.

| | |
|---|---|
| 1S | ship every pixel *(default)* |
| 2S | ship every 2nd pixel, both horizontally and vertically |
| 3S | ship every 3rd pixel, both horizontally and vertically |

Example of Pixel Ship set to 1S:




Example of Pixel Ship set to 2S:



Example of Pixel Ship set to 3S:



### U - Document Image Filter

Allows you to input parameters to sharpen the edges and smooth the area between the edges of text in an image. This filter should be used with gamma correction (see page 8-10), with the imager in a stand, and the image captured using the command:

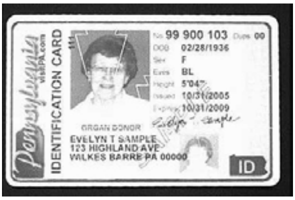
IMGSNP1P0L168W90%32D

This filter typically provides better JPEG compression than the standard E - Edge Sharpen command (see page 8-14). This filter also works well when shipping pure black and white images (1 bit per pixel). The optimal setting is 26U.

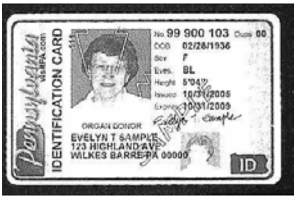
| | |
|---|---|
| 0U | Document image filter off *(default)* |
| 26U | Apply document image filter for typical document image |

*n*U Apply document image filter using grayscale threshold n. Use lower numbers when the image contrast is lower. 1U will have a similar effect to setting E - Edge Sharpen (page 8-7) to 22e. Range: 0-255.

Example of Document Image Filter set to 0U:



Example of Document Image Filter set to 26U:



**V - Blur Image**

Smooths transitions by averaging the pixels next to the hard edges of defined lines and shaded areas in an image.

0V Don't blur *(default)*

1V Blur

Example of Blur Image Off (0V):



Example of Blur Image On (1V):

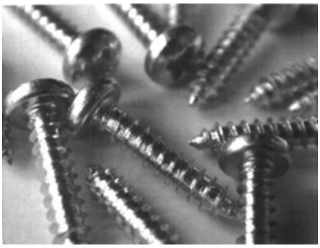


### W - Histogram Ship

A histogram gives a quick picture of the tonal range of an image, or key type. A low-key image has detail concentrated in the shadows; a high-key image has detail concentrated in the highlights; and an average-key image has detail concentrated in the midtones. This modifier ships the histogram for an image.

| | |
|---|---|
| 0W | Don't ship histogram *(default)* |
| 1W | Ship histogram |

Image used for histogram:



Histogram of image at left:



## *Intelligent Signature Capture - IMGBOX*

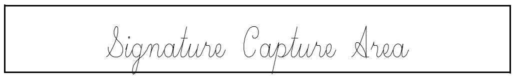
IMGBOX allows you to configure the size and location of a signature capture area relative to its proximity to a barcode. This allows you to tailor a signature capture area to a specific form. In order to use IMGBOX, you need a set form where the signature box location is in a known location relative to a barcode. You can input the overall size of the signature area, as well as specify how far the signature area is from the barcode, vertically and horizontally. You can also set the resolution and file format for the final output of the signature capture image.

*Note: IMGBOX commands can only be triggered by one of the following types of barcodes: PDF417, Code 39, Code 128, Aztec, Codabar, and Interleaved 2 of 5. Once one of these symbologies has been read, the image is retained for a possible IMGBOX command.*

The following IMGBOX example was executed and viewed using QuickView software. This software is available at www.honeywell.com/aidc. Click on **Software Downloads**. Select your device from the Products list, then select **QuickView Software Utility**.

Below is an example of a signature capture application. In this example, the aimer is centered over the signature capture area and the trigger is pressed. A single beep is emitted, indicating that the imager has read a Code 128 barcode and the data has been transferred to the host. An IMGBOX command may now be sent from the host to specify the coordinates of the signature capture area below that code, and indicating that only that area containing the signature should be transferred as an image to the host.

To see this example, align the aimer with the signature area (not with the bar-code), then press the trigger.

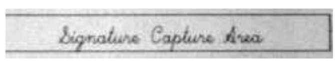



Send the following IMGBOX command string after the button push:

**IMGBOX245w37h55y.**

*Note: Case is not important in the command string. It is used here only for clarity.*

The following image is captured:




The IMGBOX commands have many different modifiers that can be used to change the size and appearance of the signature image output by the imager. Modifiers affect the image that is transmitted, but do not affect the image in memory. Modifiers always begin with a number and end with a letter (case insensitive). Any number of modifiers may be appended to the IMGBOX command.

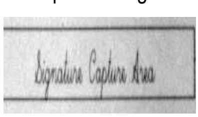
*Note: The IMGBOX command will return a NAK unless a window size (width and height) are specified. See H - Height of Signature Capture Area (page 8-16) and W - Width of Signature Capture Area (page 8-18).*

## *IMGBOX Modifiers*

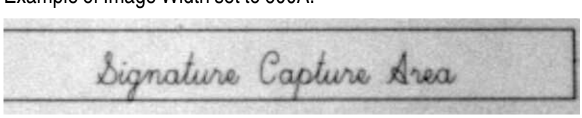
### A - Output Image Width

This option is used to size the image horizontally. If using this option, set the resolution (R) to zero.

Example of Image Width set to 200A:



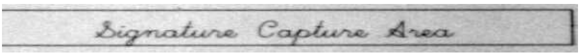
Example of Image Width set to 600A:



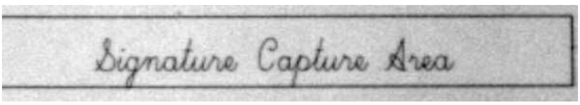
**B - Output Image Height**

This option is used to size the image vertically. If using this option, set the resolution (R) to zero.

Example of Image Height set to 50B:




Example of Image Height set to 100B:




**D - Pixel Depth**

This indicates the number of bits per pixel in the transmitted image, which defines whether it will be grayscale or black and white.

8D 8 bits per pixel, grayscale image *(default)*

1D 1 bit per pixel, black and white image

**F - File Format**

This option indicates the type of file format in which to save the image.

0F KIM format

1F TIFF binary

2F TIFF binary group 4, compressed

3F TIFF grayscale

4F Uncompressed Binary

5F Uncompressed grayscale

6F JPEG image *(default)*

7F Outlined image

8F BMP format

**H - Height of Signature Capture Area**

The height of the signature capture area must be measured in inches divided by .01. In the example, the height of the area to be captured is 3/8 inch, resulting in a value of H = .375/0.01 = 37.5.

Example: **IMGBOX245w37h55y.**

### K - Gamma Correction

Gamma measures the brightness of midtone values produced by the image. You can brighten or darken an image using gamma correction. A higher gamma correction yields an overall brighter image. The lower the setting, the darker the image. The optimal setting for text images is 50K.

| | |
|---|---|
| 0K | Gamma correction off *(default)* |
| 50K | Apply gamma correction for brightening typical document image |
| *n*K | Apply gamma correction factor *n* (*n* = 1-255) |

Example of Gamma Correction set to 0K:




Example of Gamma Correction set to 50K:



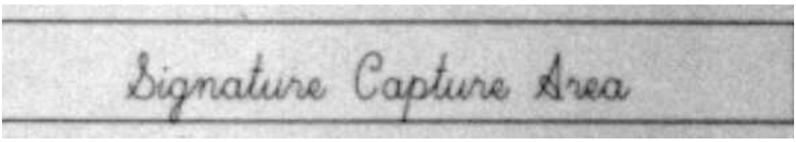

Example of Gamma Correction set to 255K:



### R - Resolution of Signature Capture Area

The resolution is the number of pixels that the imager outputs per each minimum bar width. The higher the value for R, the higher the quality of the image, but also the larger the file size. Values begin at 1000. The imager automatically inserts a decimal point between the first and second digit. For example, use 2500 to specify a resolution of 2.5. Set to zero when using the A and B modifiers (see A - Output Image Width and B - Output Image Height on page 8-16).

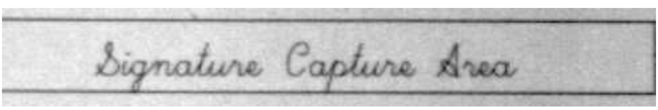
Example of Resolution set to 0R:




Example of Resolution set to 1000R:




Example of Resolution set to 2000R:




### S - Barcode Aspect Ratio

All dimensions used in IMGBOX are measured as multiples of the minimum element size of the barcode. The barcode aspect ratio allows you to set the ratio of the barcode height to the narrow element width. In the example, the narrow element width is .010 inches and the barcode height is 0.400 inches, resulting in a value of S = 0.4/0.01 = 40.

### W - Width of Signature Capture Area

The width of the signature capture area must be measured in inches divided by .01. In the example, the width of the area to be captured is 2.4 inches, resulting in a value of W = 2.4/0.01 = 240. (A value of 245 was used in the example to accommodate a slightly wider image area.)

Example: IMGBOX**245w**37h55y.

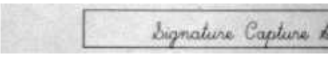
**X - Horizontal Barcode Offset**

The horizontal barcode offset allows you to offset the horizontal center of the signature capture area. Positive values move the horizontal center to the right and negative values to the left. Measurements are in multiples of the minimum bar width.

Example of Horizontal Offset set to 75X:




Example of Horizontal Offset set to -75X:

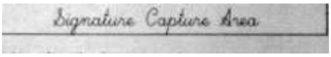



**Y - Vertical Barcode Offset**

The vertical barcode offset allows you to offset the vertical center of the signature capture area. Negative numbers indicate that the signature capture is above the barcode, and positive numbers indicate that the area is below the barcode. Measurements are in multiples of the minimum bar width.

Example of Vertical Offset set to -7Y:

Example of Vertical Offset set to 65Y:



9

# OCR Programming

Use this section to program the Imager for optical character recognition (OCR). The 2D imager reads 6 to 60 point OCR typeface.

*Note: OCR is not as secure as barcodes. To enhance security in OCR applications, create an OCR template to match the data, and print an OCR check character.*

The 2D imager will read OCR-A, OCR-B, U.S. Currency Serial Number (Money), MICR E-13B, and SEMI Font.

You can either select an OCR default, or create your own custom template for the type of OCR format you intend to read. See "OCR" on page 9-1 for programming codes that will enable your imager to read OCR-A, OCR-B, U.S. Currency, MICR E 13 B, or SEMI fonts. See "OCR Templates" on page 9-3 if you want to create a custom “template,” or character string that defines the length and content of OCR strings that will be read with your imager.

*Note: Setting the template and check character options are essential for OCR reading.*

## OCR Fonts

**Default All OCR Settings** turns off all OCR capability in the imager, so the imager will be able to scan linear, stacked, matrix, and composite barcodes, but not OCR fonts. In addition, any OCR templates you have created are erased. The eight digit default templates are reinstated for any future use of the **OCR On** codes listed below.

*< Default All OCR Settings >*

## OCR

*Note: OCR symbols can misread when scanned sideways or upside down. Use Working Orientation, page 3-22, if your OCR symbols will not usually be presented upright to the imager.*

Only one OCR symbology can be read at a time.

**OCR-A On** allows you to scan characters in the OCR-A font. The default setting allows you to scan any eight digit combination. If you have created an OCR template, character combinations that fit the template can be scanned (see Creating an OCR Template, page 9-3).

OCR-A On

**OCR-B On** allows you to scan characters in the OCR-B font. The default setting allows you to scan any eight digit combination. If you have created an OCR template, character combinations that fit the template can be scanned (see Creating an OCR Template, page 9-3).

OCR-B On

## U.S. Currency Font

**U.S. Currency On** allows you to scan characters in the font used on U.S. currency. The default setting allows you to scan any eight digit combination. If you have created an OCR template, character combinations that fit the template can be scanned (see Creating an OCR Template, page 9-3).

U.S. Currency On

## MICR E13 B Font

**MICR E13 B On** allows you to scan MICR characters on a bank check. The default setting allows you to scan any eight digit combination. If you have created an OCR template, character combinations that fit the template can be scanned (see Creating an OCR Template, page 9-3).

MICR E 13 B On

*Note: TOAD characters (Transit, On Us, Amount and Dash) are output in the following manner:*

- ⑆ the transit character is output as **T**
- ⑇ the amount character is output as **A**
- ⑈ the on us character is output as **O**
- ⑉ the dash character is output as **D**

## SEMI Font

**SEMI Font On** allows you to scan the SEMI font used in the semiconductor industry.

SEMI Font On

**All OCR Off** turns off all OCR capability in the imager, so the imager will be able to scan linear, stacked, matrix, and composite barcodes, but not OCR fonts. However, any OCR templates you have created will be retained in memory.

* All OCR Off

## OCR Templates

You can create a custom “template,” or character string that defines the length and content of OCR strings that will be read with your imager. There are several choices when creating a custom template for your application. You can create a template for a single format, you can string together several formats, and you can create a template for a user-defined variable. These choices are described in detail below.

### Creating an OCR Template

A single template allows you to program the imager to read any combination of characters in the order you specify. Refer to examples that follow the Template Characters table below.

## *Template Characters*

| | |
|---|---|
| a | represents any alphanumeric character (digit or letter) |
| c | represents that a check character is verified but not transmitted |
| d | represents any digit |
| e | represents any available OCR character |
| g | represents character from user-defined variable “g” |
| h | represents character from user-defined variable “h” |
| i | represents character from user-defined variable “g” or “h” |
| k | represents that a check character is verified but transmitted |
| l | represents any uppercase letter |
| t | marks the start of a new template |
| r | multi row indicator |
| All other characters represent themselves. Spaces can be used. Note: In MICR E13 B templates, TOAD characters (capital letters T, O, A, and D), represent Transit, On Us, Amount, and Dash. | |

*Note: OCR templates default to eight digits, no check character.*

*To Add an OCR Template*

1. Turn on the OCR font you want to read (page 9-1).
2. Begin building the template.
   Scan the **Enter OCR Template** symbol (page 9-13).
3. Scan the characters for the string.
   Use the Template Characters chart above to determine what characters you need to create your format. Use the OCR Programming Chart (after the Sample Codes in the back of this manual) to scan the characters for your template.

   **Example:** You need to read any combination of eight digits. The template would be:

   dddddddd

   To create this template, you would enable the OCR-A font. Scan the **Enter OCR Template** symbol (page 9-13), then scan the ***d*** from the OCR Programming Chart in the back of this manual eight times. Scan **Save OCR Template** (page 9-13). This would let you read any string of eight digits, for example:

   37680981

**Character Match Sequences**
This method is used if you need a template that shows a specific character in a specific position. Put the character in uppercase in the template at the required position (template characters are always lower case).

**Example:** You need to read three variable digits, three specific characters (ABC), followed by three variable digits. The template would be:

dddABCddd

Using Visual Xpress (see page 11-4), you can enter the template as shown above, enclosing the whole string between quotes: “dddABCddd”.

You may also create this character match sequence by scanning barcodes. Scan the **Enter OCR Template** symbol (page 9-13). Scan the ***d*** from the OCR Programming Chart in the back of this manual three times. Then scan **414243** from the inside back cover (the hex characters for “A,” “B,” and “C”), and scan the ***d*** three more times. Scan **Save OCR Template*,*** page 9-13. This would let you read any string of three digits, “ABC,” then any string of three digits, for example:

551ABC983

(The above OCR sample is OCR-A. You must enable the OCR-A font (page 9-1) in order to read it.)

**Adding Spaces**
You may also need to put spaces in your template. A space is seen as a character, therefore you can use the directions for Character Match Sequences, above, to add spaces to a string. (The hex value for a space is 20.)

4. Exit OCR Template Editor
   Scan **Save OCR Template** to save your entries. **Discard OCR Template** exits without saving any OCR Template changes.

### *Stringing Together Multiple Formats (Creating “Or” Statements)*

You may want to program the imager to accept many OCR formats. To do this, you would string together each format with a “t.” This tells the imager to read optical characters that match any one of the formats in the template.

**Example:** You need to read any combination of eight digits, *or* a combination of four digits, two uppercase letters, and two digits. The template would be:

ddddddddtddddlldd

To create this template, you would enable the OCR-A font. Scan the **Enter OCR Template** symbol (page 9-13). Scan the ***d*** from the OCR Programming Chart in the back of this manual eight times, then scan the **t** to create the "or" statement. Then you would scan the characters for the second template. Scan ***d*** four times, scan **l** *two times*, then scan **d** two more times. Scan **Save OCR Template** (page 9-13). This would let you read either type of format, for example:

99028650

*or*

9902XZ50

You can string together as many templates as you need.

## OCR User-Defined Variables

You can create up to two of your own user variables for an OCR template. These variables will represent any OCR readable characters. The user-defined variables are stored under the letters "g" and "h." You need a variable to represent the letters "A," "B," or "C." The template for this user-defined variable would be:

ABC

Using Visual Xpress (see page 11-4), you can enter the string as shown above into the "G variable" text box. You must enclose the strings between quotes: "ABC".

You may also create this user-defined variable by scanning barcodes. Scan the **Enter User-Defined Variable g** symbol (page 9-13). Then scan **414243** from the inside back cover (the hex characters for "A," "B," and "C"), Scan **Save OCR Template***,* page 9-13. This will let you read either A or B or C in any position where you place the g in the template. For example, you could create the following template:

ddddddggg

(Using Visual Xpress, you must enter "ddddddggg" in the Template text box.)

This template would then let you read data that began with six digits, and had an A, B, or C trailing. So you would be able to read:

654321ABC

*or*

654321BAC

*or*

654321CCC

(The above OCR sample is OCR-A. You must enable the OCR-A font (page 9-1) in order to read it.)

### *Reading Multi-Row OCR*

The  imager is capable of decoding multi-row OCR text.

*Note: Reading rows longer than sixteen characters is not recommended.*

Consider the following example.  This example shows serial commands as they would be entered using Quick*View.

**Example:** You need to read multiple rows of OCR-A data as shown below:

12345678

ABCDEFGH

First, enable the OCR-A font.  To read the first row of OCR data, you would program the following template:

OCRTMP"dddddddd".

This template is the default OCR template.  If you wanted to read the second line of data, you would use the following template:

OCRTMP"llllllll".

To read both lines of OCR at one time, use the variable ***r*** to indicate the start of a new row.  All the other templating variables for the individual rows work the same as previously described.  For instance, in the above example, you would use the following template to read both rows:

OCRTMP"ddddddddrllllllll".

To read the three rows below, you would use the template command "OCRTMP"ddddddddrllllllllrlllldddd".

12345678

ABCDEFGH

ABCD1234

## *OCR Check Character*

You may want to print and verify a check character in order to enhance the security of your OCR application. The imager can be programmed for almost any type of check character.  A number of presets are provided for common check character uses (e.g., modulo 10 and modulo 36).

Scan the **OCR Modulo 10** or **OCR Modulo 36 Check Character** barcode to specify the type of check character used in the OCR strings you're scanning. The imager will then only read OCR character strings with a valid check character.  The imager transmits the OCR data without the check character data.  You must specify the location of the check character in the template with a **c**.

**Example:** You need to read any combination of seven digits, with a modulo 10 check character in the eighth position. The template would be:

ddddddc

To create this template, you would enable the OCR-A font. Scan the **Modulo 10 Check Character** symbol. Then scan the **Enter OCR Template** symbol, and scan the **d** from the OCR Programming Chart seven times, and scan the ***c*** once. Scan **Save OCR Template** (page 9-13). This template will let you read any combination of six digits with a correct check character after. (If the check character is invalid, the data is discarded.) For example, the following string could be scanned:

01234569

and the output would be: 0123456

### *OCR Modulo 10 Check Character*

Scan this symbol to program the OCR template for a simple modulo 10 checksum of the digits 0 through 9.

OCR Modulo 10 Check Character

### *OCR Modulo 36 Check Character*

Scan this symbol to program the OCR template for a simple modulo 36 checksum of the digits 0 through 9 and the letters A through Z.

OCR Modulo 36 Check Character

## *OCR User-Defined Check Character*

You can customize the check character calculation to suit your application. Each character of the check character alphabet can be programmed in its proper order. The number of characters you enter determines the modulo value for the calculation. By default, the check character computation is unweighted, but the imager also supports two weighted modulo 10 checking schemes.

**Example:** To program a modulo 11 check character, you would enter the following 11 characters in order:

**0123456789X**

Also enter the OCR template:

**ddddddddc**

Enable the OCR-A font, then scan the following string:

6512351X

The imager performs the following check character computation:

(6 + 5 + 1 + 2 +3 + 5 + 1 + X) modulo 11 = 0

Since the result is zero, the message is considered to be valid, so the reader outputs the message: 6512351

### *Programming a User-Defined Check Character*

1. Scan the **Enter OCR Check Character** barcode, below.

Enter OCR Check Character

2. Enter the characters in order. For each character, look up the corresponding hex value from the ASCII Conversion Chart (Code Page 1252), page A-4. Use the Programming Chart on the inside the back cover of this manual to scan the two symbols for each hex value.
3. Scan the **Save** barcode on the inside back cover.

**Example:** To program the modulo 11 check character from example #8 on page 9-8, enable the OCR-A font. Scan the **Enter OCR Check Character** barcode on page 9-9, then scan the following hex values in order:

**3031323334353637383958**

After you enter all the desired hex values, scan the **Save** barcode on the inside back cover of this manual.

### *Weighting Options*

By default, the check character computation is unweighted. It is possible to use one of two weighted modulo 10 schemes. Weighting is often used to detect if two neighboring characters are transposed, a common error when an operator keys in data.

## 3-1-3-1 Weighted Modulo 10 Check Character

Starting with the check character and working backward through the message, the imager applies a multiplier of 1, then 3, then 1, then 3, and so on. This is the checking scheme used in many GS1 symbologies, including U.P.C. and Interleaved 2 of 5 (when a check digit is invoked). To apply this weighting scheme, set the OCR check character to **"0123456789x3x1"** or scan the following symbol:

3-1-3-1 Weighted Modulo 10
Check Character

**Example:** Scan the 3-1-3-1 Weighted Modulo 10 Check Character symbol. Also enter the OCR template:

ddddddddc

Then scan the string below:

01234565

The reader performs the check character computation below:

(0 x 3 + 1 x 1 + 2 x 3 + 3 x 1 + 4 x 3 + 5 x 1 + 6 x 3 + 5 x 1) modulo 10 = 0

Since the result is zero, the message is considered to be valid, so the reader outputs the message: 0123456

## 2-1-2-1 Weighted Modulo 10 Check Character

Starting with the check character and working backward through the message, the imager applies a multiplier of 1, then 2, then 1, then 2, and so on. When the result of the multiplication is greater than 9, add both digits to the running sum. This is often referred to as the LUHN formula. One common application of the LUHN formula is validate credit card numbers. This is the modulo 10 checking scheme used in MSI Code and in Code 32 Pharmaceutical (PARAF). To apply this weighting scheme, set the OCR check character to **"0123456789x2x1"** or scan the following symbol:

2-1-2-1 Weighted Modulo 10
Check Character

**Example:** Scan the 2-1-2-1 Weighted Modulo 10 Check Character symbol. Also enter the OCR template:

dddddddc

Then scan the string below:

0128454

The reader performs the check character computation below:

(0 x 1 + 1 x 2 + 2 x 1 + 8 x 2 + 4 x 1 + 5 x 2 + 4 x 1) modulo 10

= (0 + 2 + 2 + (1 + 6) + 4 + (1 + 0) + 4) modulo 10

= 0

Since the result is zero, the message is considered to be valid, so the reader outputs the message: 012845

## OCR ISBN Application Example

One application of OCR is to read the ISBN characters typically encoded using the OCR-A or OCR-B font. This is especially useful when the ISBN number is not encoded in an EAN-13 barcode. The following example shows how to configure the imager to read the ISBN strings on books in Japan. After you have followed the steps below, you will be able to scan the following ISBN number or the additional data below it, depending on the line of text at which the imager is aimed.

ISBN4-594-03019-X

C0097 ¥838E

1. Scan the OCR-B On barcode on page 9-2.
2. Program the user-defined variable “g” to comprise the ten digits plus the dash:

   0123456789-

3. In Japan, it is common for two fields to follow the ISBN number, the three digit price field, and the four digit price field. The first field typically starts with a “C” (uppercase c), followed by four digits. The second field typically starts with a “P” or a yen symbol, followed by three or four digits, followed by an “E.” Program the user-defined variable “h” to comprise the “P” and the yen symbol (represented by a backslash).

   P\

4. Scan the symbol below to set up three templates to handle the ISBN number, the three digit price field, and the four digit price field.

5. Finally, set up the ISBN check digit, which is a special position-weighted modulo 11 checksum. The imager automatically invokes the ISBN checksum for template rows that are:
   1.) at least fourteen characters long,
   2.) whose first four characters are the letters "ISBN,"
   3.) whose last character is a check character, and
   4.) when the modulo 11 check character "0123456789X" is programmed.

Please note that all these commands can be combined into a single serial programming command:

OCRENA2,TMP"ISBNggggggggggggctCdddd hdddEtCdddd hddddE",GPG"0123456789-",GPH"P\",CHK"0123456789X".

These commands can be encoded into the following Aztec Code symbol:

# OCR Template Codes

*Note: Reading more than three rows of OCR is not recommended. Contact the factory if you have an application that requires reading four or more rows of OCR.*

Enter OCR Template †

Enter User-Defined Variable “g”†

Enter User-Defined Variable “h”†

† One or more two-digit numbers and **Save** are required after reading this programming symbol. Refer to the Programming Chart on the inside the back cover of this manual.

## Exit Selections

Save OCR Template

Discard OCR Template

# 10 Interface Keys

## Keyboard Function Relationships

The following Keyboard Function Code, Hex/ASCII Value, and Full ASCII "CTRL"+ relationships apply to all terminals that can be used with the imager. Refer to page 2-7 enable Control + ASCII mode.

| Function Code | HEX/ASCII Value | Full ASCII "CTRL" + |
|---|---|---|
| NUL | 00 | @ |
| SOH | 01 | A |
| STX | 02 | B |
| ETX | 03 | C |
| EOT | 04 | D |
| ENQ | 05 | E |
| ACK | 06 | F |
| BEL | 07 | G |
| BS | 08 | H |
| HT | 09 | I |
| LF | 0A | J |
| VT | 0B | K |
| FF | 0C | L |
| CR | 0D | M |
| SO | 0E | N |
| SI | 0F | O |
| DLE | 10 | P |
| DC1 | 11 | Q |
| DC2 | 12 | R |
| DC3 | 13 | S |
| DC4 | 14 | T |
| NAK | 15 | U |
| SYN | 16 | V |
| ETB | 17 | W |
| CAN | 18 | X |
| EM | 19 | Y |
| SUB | 1A | Z |
| ESC | 1B | [ |
| FS | 1C | \ |
| GS | 1D | ] |
| RS | 1E | ^ |
| US | 1F | _ |

The last five characters in the Full ASCII "CTRL"+ column ( [ \ ] 6 - ), apply to US only. The following chart indicates the equivalents of these five characters for different countries.

| Country | Codes | | | | |
|---|---|---|---|---|---|
| United States | [ | \ | ] | 6 | - |
| Belgium | [ | < | ] | 6 | - |
| Scandinavia | 8 | < | 9 | 6 | - |
| France | ^ | 8 | $ | 6 | = |
| Germany | | Ã | + | 6 | - |
| Italy | | \ | + | 6 | - |
| Switzerland | | < | . . | 6 | - |
| United Kingdom | [ | ¢ | ] | 6 | - |
| Denmark | 8 | \ | 9 | 6 | - |
| Norway | 8 | \ | 9 | 6 | - |
| Spain | [ | \ | ] | 6 | - |

## Supported Interface Keys

| ASCII | HEX | IBM AT/XT and PS/2 Compatibles, WYSE PC/AT Supported Keys | IBM XTs and Compatibles Supported Keys | IBM, DDC, Memorex Telex, Harris* Supported Keys |
|---|---|---|---|---|
| NUL | 00 | Reserved | Reserved | Reserved |
| SOH | 01 | Enter (KP) | CR/Enter | Enter |
| STX | 02 | Cap Lock | Caps Lock | F11 |
| ETX | 03 | ALT make | Reserved | F12 |
| EOT | 04 | ALT break | Reserved | F13 |
| ENQ | 05 | CTRL make | Reserved | F14 |
| ACK | 06 | CTRL break | Reserved | F15 |
| BEL | 07 | CR/Enter | CR/Enter | New Line |
| BS | 08 | Reserved | Reserved | F16 |
| HT | 09 | Tab | Tab | F17 |
| LF | 0A | Reserved | Reserved | F18 |
| VT | 0B | Tab | Tab | Tab/Field Forward |
| FF | 0C | Delete | Delete | Delete |
| CR | 0D | CR/Enter | CR/Enter | Field Exit/New Line |
| SO | 0E | Insert | Insert | Insert |
| SI | 0F | Escape | Escape | F19 |
| DLE | 10 | F11 | Reserved | Error Reset |
| DC1 | 11 | Home | Home | Home |
| DC2 | 12 | Print | Print | F20 |
| DC3 | 13 | Back Space | Back Space | Back Space |
| DC4 | 14 | Back Tab | Back Tab | Backfield/Back Tab |
| NAK | 15 | F12 | Reserved | F21 |
| SYN | 16 | F1 | F1 | F1 |
| ETB | 17 | F2 | F2 | F2 |
| CAN | 18 | F3 | F3 | F3 |
| EM | 19 | F4 | F4 | F4 |
| SUB | 1A | F5 | F5 | F5 |
| ESC | 1B | F6 | F6 | F6 |
| FS | 1C | F7 | F7 | F7 |
| GS | 1D | F8 | F8 | F8 |
| RS | 1E | F9 | F9 | F9 |
| US | 1F | F10 | F10 | F10 |

* IBM 3191/92, 3471/72, 3196/97, 3476/77, Telex (all models)

## *Supported Interface Keys*

| ASCII | HEX | IBM, Memorex Telex (102)* Supported Keys | Memorex Telex (88)** Supported Keys |
|---|---|---|---|
| NUL | 00 | Reserved | Reserved |
| SOH | 01 | Enter | Enter |
| STX | 02 | F11 | PF10 |
| ETX | 03 | F12 | PF11 |
| EOT | 04 | F13 | PF12 |
| ENQ | 05 | F14 | Reserved |
| ACK | 06 | F15 | Reserved |
| BEL | 07 | New Line | New Line |
| BS | 08 | F16 | Field Forward |
| HT | 09 | F17 | Field Forward |
| LF | 0A | F18 | Reserved |
| VT | 0B | Tab/Field Forward | Field Forward |
| FF | 0C | Delete | Delete |
| CR | 0D | Field Exit | New Line |
| SO | 0E | Insert | Insert |
| SI | 0F | Clear | Erase |
| DLE | 10 | Error Reset | Error Reset |
| DC1 | 11 | Home | Reserved |
| DC2 | 12 | Print | Print |
| DC3 | 13 | Back Space | Back Space |
| DC4 | 14 | Back Tab | Back Field |
| NAK | 15 | F19 | Reserved |
| SYN | 16 | F1 | PF1 |
| ETB | 17 | F2 | PF2 |
| CAN | 18 | F3 | PF3 |
| EM | 19 | F4 | PF4 |
| SUB | 1A | F5 | PF5 |
| ESC | 1B | F6 | PF6 |
| FS | 1C | F7 | PF7 |
| GS | 1D | F8 | PF8 |
| RS | 1E | F9 | PF9 |
| US | 1F | F10 | Home |

* IBM 3196/97, 3476/77, 3191/92, 3471/72, Memorex Telex (all models) with 102 key keyboards
** Memorex Telex with 88 key keyboards

## Supported Interface Keys

| ASCII | HEX | Esprit 200, 400 ANSI Supported Keys | Esprit 200, 400 ASCII Supported Keys | Esprit 200, 400 PC Supported Keys |
|---|---|---|---|---|
| NUL | 00 | Reserved | Reserved | Reserved |
| SOH | 01 | New Line | New Line | New Line |
| STX | 02 | N/A | N/A | N/A |
| ETX | 03 | N/A | N/A | N/A |
| EOT | 04 | N/A | N/A | N/A |
| ENQ | 05 | N/A | N/A | N/A |
| ACK | 06 | N/A | N/A | N/A |
| BEL | 07 | New Line | New Line | New Line |
| BS | 08 | N/A | N/A | N/A |
| HT | 09 | Tab | Tab | Tab |
| LF | 0A | N/A | N/A | N/A |
| VT | 0B | Tab | Tab | Tab |
| FF | 0C | N/A | N/A | Delete |
| CR | 0D | New Line | New Line | New Line |
| SO | 0E | N/A | N/A | Insert |
| SI | 0F | Escape | Escape | Escape |
| DLE | 10 | F11 | F11 | F11 |
| DC1 | 11 | Insert | Insert | Home |
| DC2 | 12 | F13 | F13 | Print |
| DC3 | 13 | Back Space | Back Space | Back Space |
| DC4 | 14 | Back Tab | Back Tab | Back Tab |
| NAK | 15 | F12 | F12 | F12 |
| SYN | 16 | F1 | F1 | F1 |
| ETB | 17 | F2 | F2 | F2 |
| CAN | 18 | F3 | F3 | F3 |
| EM | 19 | F4 | F4 | F4 |
| SUB | 1A | F5 | F5 | F5 |
| ESC | 1B | F6 | F6 | F6 |
| FS | 1C | F7 | F7 | F7 |
| GS | 1D | F8 | F8 | F8 |
| RS | 1E | F9 | F9 | F9 |
| US | 1F | F10 | F10 | F10 |

## Supported Interface Keys

| ASCII | HEX | Apple Mac/iMac Supported Keys |
|---|---|---|
| NUL | 00 | Reserved |
| SOH | 01 | Enter/Numpad Enter |
| STX | 02 | CAPS |
| ETX | 03 | ALT make |
| EOT | 04 | ALT break |
| ENQ | 05 | CNTRL make |
| ACK | 06 | CNTRL break |
| BEL | 07 | RETURN |
| BS | 08 | APPLE make |
| HT | 09 | TAB |
| LF | 0A | APPLE break |
| VT | 0B | TAB |
| FF | 0C | Del |
| CR | 0D | RETURN |
| SO | 0E | Ins Help |
| SI | 0F | ESC |
| DLE | 10 | F11 |
| DC1 | 11 | Home |
| DC2 | 12 | Prnt Scrn |
| DC3 | 13 | BACKSPACE |
| DC4 | 14 | LSHIFT TAB |
| NAK | 15 | F12 |
| SYN | 16 | F1 |
| ETB | 17 | F2 |
| CAN | 18 | F3 |
| EM | 19 | F4 |
| SUB | 1A | F5 |
| ESC | 1B | F6 |
| FS | 1C | F7 |
| GS | 1D | F8 |
| RS | 1E | F9 |
| US | 1F | F10 |
| DEL | 7F | BACKSPACE |

# 11 Utilities

## To Add a Test Code I.D. Prefix to All Symbologies

This selection allows you to turn on transmission of a Code I.D. before the decoded symbology. (See the Symbology Chart, page A-1, for the single character code that identifies each symbology.) This action first clears all current prefixes, then programs a Code I.D. prefix for all symbologies. This is a temporary setting that will be removed when the unit is power cycled.

Add Code I.D. Prefix to
All Symbologies (Temporary)

## Show Decoder Revision

Scan the barcode below to output the decoder revision.

*Note: You may use the Show Decoder Revision option if you have firmware with a base number of 31205480. Refer to Show Software Revision on page 11-2 for information on determining the firmware revision in your unit.*

Show Decoder Revision

## Show Engine Revision

*Note: You may use the Show Engine Revision option if you have firmware with a base number of 31205480.*

Scan the barcode below to output the engine revision. Your imager returns the engine type, revision number, and status character [ACK]. For example, an imager with a 5100 engine, version 26 would return:

```
ENGREVType:  1  Revision: 26[ACK]
```

Show Engine Revision

## *Show Scan Driver Revision*

Scan the barcode below to output the scan driver revision. The scan driver controls image capture.

*You may use the Show Scan Driver Revision option if you have firmware with a base number of 31205480. Refer to the Show Software Revision below for information on determining the firmware revision in your unit.*

Show Scan Driver Revision

## *Show Software Revision*

Scan the barcode below to output the current software revision, unit serial number, and other product information.

Show Software Revision

## *Show Data Format*

Scan the barcode below to show current data format settings.

Data Format Settings

## *Resetting the Standard Product Defaults*

If you aren't sure what programming options are in your imager, or you've changed some options and want the standard product default settings restored, scan the **Standard Product Default Settings** barcode below.

Standard Product Default Settings

The Menu Commands starting on page 12-4 lists the standard product default settings for each of the commands (indicated by an asterisk (*) on the programming pages).

# Test Menu

When you scan the Test Menu **On** code, then scan a programming code in this manual, the imager displays the content of a programming code. The programming function will still occur, but in addition, the content of that programming code is output to the terminal.

*Note: This feature should not be used during normal imager operation.*

On

* Off

# 2D PQA (Print Quality Assessment)

Two-dimensional Print Quality Assessment (2D PQA) is a feature of Honeywell’ image readers where the data from the successful read of a 2D barcode symbol is augmented with lines of text that both identify the symbol, and also report graded measurement parameters obtained from it.

## 2D PQA Reporting

Honeywell' 2D PQA reporting can be enabled in two different modes: Full Report or Screening. (To see displayed results, Microsoft® Notepad, a word processor/editing program, or Quick*View (page 11-6) is recommended.)

If you are using Quick*View, you can enable Full Report, a listing of all of a symbol's identifying information, measurements, and corresponding grades, by typing the following menu command:

```
2D_PQA1
```

or by scanning the following barcode:

Full Report

*Note: The PQA report is sent out as a second data/beep sequence after the barcode data. The report has its own Honeywell code ID of >(0X3E) so it can be uniquely identified.*

You can exit Full Report mode by either typing the menu command, 2D_PQA0, if you are using Quick*View, or by scanning the following barcode:

Exit

*Note: For additional information on interpreting your read results, please refer to Honeywell Quick Check 2D Print Assessment User's Guide.*

## Visual Xpress Introduction

*Note: Software revision 31205480-118 or higher is backward compatible with all non-advanced illumination units. This new revision of software can be flashed in non-advanced illumination units for full backward compatibility. Software 31205480-090 or lower cannot be flashed into units with advanced illumination. Visual Xpress will display an incompatibility error message.*



Non-Advanced Illumination Unit | Advanced Illumination Unit

Visual Xpress provides a wide range of PC-based programming functions that can be performed on an imager connected to your PC's COM port. Visual Xpress allows you to download upgrades to the imager's firmware, change programmed parameters, and create and print programming barcodes. Using Visual Xpress, you can even save/open the programming parameters for an imager. This saved file can be e-mailed or, if required, you can create a single barcode that contains all the customized programming parameters and mail or fax that barcode to any location. Users in other locations can scan the barcode to load in the customized programming.

To communicate with an imager, Visual Xpress requires that the PC have at least one available serial communication port, or a serial port emulation using a physical USB port. If you are using the serial port and RS-232 cable, an external power supply is required. When using a USB serial port emulation, only a USB cable is required.

### Visual Xpress Operations

The Visual Xpress software performs the following operations:

### Scan Data

Scan Data allows you to scan barcodes and display the barcode data in a window. Scan Data lets you send serial commands to the imager and receive imager response that can be seen in the Scan Data window. The data displayed in the Scan Data window can either be saved in a file or printed.

### Configure

Configure displays the programming and configuration data of the imager. The imager's programming and configuration data is grouped into different categories. Each category is displayed as a tree item under the "Configure" tree node in the application explorer. When one of these tree nodes is clicked, the right-hand side is loaded with the parameters' form belonging to that particular category. The "Configure" tree option has all the programming and configuration parameters specified for an imager. You can set or modify these parameters as required. You can later write the modified settings to the imager, or save them to a dcf file.

### Imaging

Imaging provides all the image-related functions that a 2D Imager can perform. You can capture an image using the current settings, and the image will be displayed in an image window. Images captured from the imager can be saved to files in different image formats. You can modify the image settings and save the image settings to an INI file, which can be loaded later to capture new images. Imaging also lets you preview the images continuously captured by the imager.

## *Installing Visual Xpress from the Web*

*Note: Visual Xpress requires .NET software. If .NET is not installed on your PC, you will be prompted to install it during the Visual Xpress installation.*

1. Access the Honeywell web site at www.honeywell.com/aidc.
2. Click on the **Resources** tab. Select **Product Downloads-Software**.
3. Click on the dropdown for **Select Product Number**. Click on **4600g**.
4. Click on the listing for **Visual Xpress**.
5. When prompted, select **Save File**, and save the files to the **c:\windows\temp** directory.
6. Once you have finished downloading the file, exit the web site.
7. Using Explorer, go to the **c:\windows\temp** file and unzip the file you saved.
8. Double click on **Setup.exe** and follow the screen prompts to install the Visual Xpress program.
9. If you've selected the defaults during installation, you can click on **Start Menu-All Programs-Hand Held Products-Visual Xpress**.

# Quick*View

Quick*View is a Microsoft Windows® program that displays decoded symbol messages and captures images (for instance, ID photographs) from the imager. Barcode information and images are displayed in the Quick*View window.

### Installing Quick*View from the Web

1. Access the Honeywell web site at www.honeywell.com/aidc.
2. Click on the **Resources** tab. Select **Product Downloads-Software**.
3. Click on the dropdown for **Select Product Number**. Click on **4600g**.
4. Click on the listing for **Quick*View Software Utility**.
5. When prompted, select **Save**, and save the files to the **c:\windows\temp** directory.
6. Once you have finished downloading the file, exit the web site.
7. Using Explorer, go to the **c:\windows\temp** file.
8. Double click on the **Quickview.exe** file. Follow the screen prompts to install the Quick*View program.
9. To start Quick*View, from the Start Menu click on **All Programs**-**Quick*View**-**Quick*View**.

*Note: If you wish, you can create a shortcut to the Quick*View executable on your desktop.*

# Temporary Quick*View Configuration

For a quick download communication configuration, scan the **Quick*View** barcode and the imager will be temporarily configured for Quick*View settings.

*Note: If you have a unit capable of keyboard wedge mode, scan the barcode below and the unit will communicate in RS-232 mode, allowing it to work with Quick*View. To convert the imager back to keyboard wedge communication, cycle the power.*

Quick*View

# 12 Serial Programming Commands

The serial programming commands can be used in place of the programming barcodes. Both the serial commands and the programming barcodes will program your imager. For complete descriptions and examples of each serial programming command, refer to the corresponding programming barcode in this manual.

The device must be set to an RS-232 interface (see page 1-11). The following commands can be sent via a PC COM port using terminal emulation software.

## Conventions

The following conventions are used for menu and query command descriptions:

| | |
|---|---|
| *parameter* | A label representing the actual value you should send as part of a command. |
| [*option*] | An optional part of a command. |
| {Data} | Alternatives in a command. |
| **bold** | Names of menus, menu commands, buttons, dialog boxes, and windows that appear on the screen. |

## Menu Command Syntax

Menu commands have the following syntax (spaces have been used for clarity only):

*Prefix Tag SubTag {Data} [, SubTag {Data}] [; Tag SubTag {Data}] […] Storage*

| | |
|---|---|
| Prefix | Three ASCII characters: **SYN M CR** (ASCII 22,77,13). |
| Tag | A 3 character case-insensitive field that identifies the desired menu command group. For example, all RS-232 configuration settings are identified with a Tag of **232**. |
| SubTag | A 3 character case-insensitive field that identifies the desired menu command within the tag group. For example, the SubTag for the RS-232 baud rate is **BAD**. |
| Data | The new value for a menu setting, identified by the Tag and SubTag. |
| Storage | A single character that specifies the storage table to which the command is applied. An exclamation point (**!**) performs the command's operation on the device's volatile menu configuration table. A period (**.**) performs the command's operation on the device's non-volatile menu configuration table. Use the non-volatile table only for semi-permanent changes you want saved through a power cycle. |

## *Query Commands*

Several special characters can be used to query the device about its settings.

**^** What is the default value for the setting(s).

**?** What is the device's current value for the setting(s).

***** What is the range of possible values for the setting(s). (The device's response uses a dash (**-**) to indicate a continuous range of values. A pipe (**|**) separates items in a list of non-continuous values.)

**Tag Field Usage**

When a query is used in place of a Tag field, the query applies to the *entire* set of commands available for the particular storage table indicated by the Storage field of the command. In this case, the SubTag and Data fields should not be used because they are ignored by the device.

**SubTag Field Usage**

When a query is used in place of a SubTag field, the query applies only to the subset of commands available that match the Tag field. In this case, the Data field should not be used because it is ignored by the device.

**Data Field Usage**

When a query is used in place of the Data field, the query applies only to the specific command identified by the Tag and SubTag fields.

### *Concatenation of Multiple Commands*

Multiple commands can be issued within one Prefix/Storage sequence. Only the Tag, SubTag, and Data fields must be repeated for each command in the sequence. If additional commands are to be applied to the same Tag, then the new command sequence is separated with a comma (**,**) and only the SubTag and Data fields of the additional command are issued. If the additional command requires a different Tag field, the command is separated from previous commands by a semicolon (**;**).

### *Responses*

The device responds to serial commands with one of three responses:

**ACK** Indicates a good command which has been processed.

**ENQ** Indicates an invalid Tag or SubTag command.

**NAK** Indicates the command was good, but the Data field entry was out of the allowable range for this Tag and SubTag combination, e.g., an entry for a minimum message length of 100 when the field will only accept 2 characters.

When responding, the device echoes back the command sequence with the status character inserted directly before each of the punctuation marks (the period, exclamation point, comma, or semicolon) in the command.

### *Examples of Query Commands*

In the following examples, a bracketed notation [ ] depicts a non-displayable response.

*Example #1:What is the range of possible values for Codabar Coding Enable?*

**Enter:** **cbrena*.**

**Response:** **CBRENA0-1[ACK]**

This response indicates that Codabar Coding Enable (CBRENA) has a range of values from 0 to 1 (off and on).

*Example #2: What is the default value for Codabar Coding Enable?*

**Enter:** **cbrena^.**

**Response:** **CBRENA1[ACK]**

This response indicates that the default setting for Codabar Coding Enable (CBRENA) is 1, or on.

*Example #3: What is the device's current setting for Codabar Coding Enable?*

**Enter:** **cbrena?.**

**Response:** **CBRENA1[ACK]**

This response indicates that the device's Codabar Coding Enable (CBRENA) is set to 1, or on.

*Example #4: What are the device's settings for all Codabar selections?*

**Enter:** **cbr?.**

**Response:** **CBRENA1[ACK],**
**SSX0[ACK],**
**CK20[ACK],**
**CCT1[ACK],**
**MIN2[ACK],**
**MAX60[ACK],**
**DFT[ACK].**

This response indicates that the device's Codabar Coding Enable (CBRENA) is set to 1, or on;
the Start/Stop Character (SSX) is set to 0, or Don't Transmit;
the Check Character (CK2) is set to 0, or Not Required;
concatenation (CCT) is set to 1, or Enabled;
the Minimum Message Length (MIN) is set to 2 characters;
the Maximum Message Length (MAX) is set to 60 characters;
and the Default setting (DFT) has no value.

## Trigger Commands

You can activate and deactivate the imager with serial trigger commands. First, the imager must be put in Manual/Serial Trigger Mode either by scanning the Manual/Serial Trigger Mode barcode (page 3-4), or by sending the Manual/Serial Menu Command (page 12-9). Once the imager is in serial trigger mode, the trigger is activated and deactivated by sending the following commands:

Activate: **SYN T CR**

Deactivate: **SYN U CR**

The imager scans until a barcode has been read, until the deactivate command is sent, or until the serial time-out has been reached (see "Read Time-Out" on page 3-4 for a description, and the serial command on page 12-9).

## Resetting the Standard Product Defaults

If you aren't sure what programming options are in your imager, or you've changed some options and want the factory settings restored, scan the **Standard Product Default Settings** barcode below.

Standard Product Default Settings

The chart on the following pages lists the factory default settings for each of the menu commands (indicated by an asterisk (*) on the programming pages).

## Menu Commands

*Note: Not all menu commands apply to all imager models.*

| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
|---|---|---|---|
| Factory Default Settings | Default | DEFALT | 12-4 |
| ***Terminal Interfaces*** | | | |
| Terminal ID | 000 (4600g/4600r/4600rp/4800i 030 models)<br>124 (4600g/4600r/4600rp/4800i 050 models) | TERMID### | 2-1 |

| Selection | Setting<br>*** Indicates default** | Serial Command<br>*# Indicates a numeric entry* | Page |
|---|---|---|---|
| Program Keyboard Country | *U.S.A. | KBDCTY0 | 2-4 |
| | Belgium | KBDCTY1 | 2-4 |
| | Brazil | KBDCTY16 | 2-4 |
| | Canada (French) | KBDCTY18 | 2-4 |
| | Czech Republic | KBDCTY15 | 2-4 |
| | Denmark | KBDCTY8 | 2-4 |
| | Finland (Sweden) | KBDCTY2 | 2-4 |
| | France | KBDCTY3 | 2-4 |
| | Germany/Austria | KBDCTY4 | 2-4 |
| | Greece | KBDCTY17 | 2-4 |
| | Hungary | KBDCTY19 | 2-4 |
| | Israel (Hebrew) | KBDCTY12 | 2-4 |
| | Italy | KBDCTY5 | 2-5 |
| | Latin America | KBDCTY14 | 2-5 |
| | Netherlands (Dutch) | KBDCTY11 | 2-5 |
| | Norway | KBDCTY9 | 2-5 |
| | Poland | KBDCTY20 | 2-5 |
| | Portugal | KBDCTY13 | 2-5 |
| | Romania | KBDCTY25 | 2-5 |
| | Russia | KBDCTY26 | 2-5 |
| | SCS | KBDCTY21 | 2-5 |
| | Slovakia | KBDCTY22 | 2-5 |
| | Spain | KBDCTY10 | 2-5 |
| | Sweden | KBDCTY23 | 2-5 |
| | Switzerland (German) | KBDCTY6 | 2-5 |
| | Turkey F | KBDCTY27 | 2-6 |
| | Turkey Q | KBDCTY24 | 2-6 |
| | U.K. | KBDCTY7 | 2-6 |

| **Selection** | **Setting** ** Indicates default* | **Serial Command** *# Indicates a numeric entry* | **Page** |
|---|---|---|---|
| Keyboard Style | *Regular | KBDSTY0 | 2-6 |
| | Caps Lock | KBDSTY1 | 2-6 |
| | Shift Lock | KBDSTY2 | 2-7 |
| | Automatic Caps Lock | KBDSTY6 | 2-7 |
| | Emulate External Keyboard | KBDSTY5 | 2-7 |
| Keyboard Modifiers | *Control + ASCII Off | KBDCAS0 | 2-8 |
| | DOS Mode Control + ASCII | KBDCAS1 | 2-8 |
| | Windows Mode Control + ASCII | KBDCAS2 | 2-8 |
| | *Turbo Mode Off | KBDTMD0 | 2-8 |
| | Turbo Mode On | KBDTMD1 | 2-8 |
| | *Numeric Keypad Off | KBDNPS0 | 2-8 |
| | Numeric Keypad On | KBDNPS1 | 2-8 |
| | *Auto Direct Conn. Off | KBDADC0 | 2-9 |
| | Auto Direct Conn. On | KBDADC1 | 2-9 |
| Baud Rate | 300 BPS | 232BAD0 | 2-10 |
| | 600 BPS | 232BAD1 | 2-10 |
| | 1200 BPS | 232BAD2 | 2-10 |
| | 2400 BPS | 232BAD3 | 2-10 |
| | 4800 BPS | 232BAD4 | 2-10 |
| | 9600 BPS | 232BAD5 | 2-10 |
| | 19200 BPS | 232BAD6 | 2-10 |
| | *38400 BPS | 232BAD7 | 2-10 |
| | 57600 BPS | 232BAD8 | 2-10 |
| | 115200 BPS | 232BAD9 | 2-10 |

| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
|---|---|---|---|
| Word Length: Data Bits, Stop Bits, and Parity | 7 Data, 1 Stop, Parity Even | 232WRD3 | 2-11 |
| | 7 Data, 1 Stop, Parity None | 232WRD0 | 2-11 |
| | 7 Data, 1 Stop, Parity Odd | 232WRD6 | 2-11 |
| | 7 Data, 2 Stop, Parity Even | 232WRD4 | 2-11 |
| | 7 Data, 2 Stop, Parity None | 232WRD1 | 2-11 |
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| | 60 | WNDBLK2 | 2-13 |
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| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
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| | *25 | WNDSPD1 | 2-15 |
| | 40 | WNDSPD2 | 2-15 |
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| | 120 | WNDSPD4 | 2-15 |
| | 150 | WNDSPD5 | 2-15 |
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| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
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| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
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| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
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| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
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| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
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| | *Off | WNDCHK0 | 6-4 |
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| | *25 | WNDSPD1 | 6-4 |
| | 40 | WNDSPD2 | 6-4 |
| | 80 | WNDSPD3 | 6-4 |
| | 120 | WNDSPD4 | 6-4 |
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| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
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| | *On | C39ENA1 | 7-5 |
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| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
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| Code 93 | Default All Code 93 Settings | C93DFT | 7-10 |
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| | Maximum (0 - 80) *80 | C93MAX## | 7-10 |
| | Code 93 Code Page | C93DCP | 7-10 |

| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
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| Straight 2 of 5 Industrial | Default All Straight 2 of 5 Industrial Settings | R25DFT | 7-11 |
| Straight 2 of 5 Industrial | *Off | R25ENA0 | 7-11 |
| | On | R25ENA1 | 7-11 |
| Straight 2 of 5 Industrial Message Length | Minimum (1 - 48) *4 | R25MIN## | 7-11 |
| | Maximum (1 - 48) *48 | R25MAX## | 7-11 |
| Straight 2 of 5 IATA | Default All Straight 2 of 5 IATA Settings | A25DFT | 7-12 |
| Straight 2 of 5 IATA | *Off | A25ENA0 | 7-12 |
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| Straight 2 of 5 IATA Message Length | Minimum (1 - 48) *4 | A25MIN## | 7-12 |
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| Matrix 2 of 5 Message Length | Minimum (1 - 80) *4 | X25MIN## | 7-13 |
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| Code 11 Check Digits Required | 1 Check Digit | C11CK20 | 7-14 |
| | *2 Check Digits | C11CK21 | 7-14 |
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| Code 128 | Default All Code 128 Settings | 128DFT | 7-15 |
| Code 128 | Off | 128ENA0 | 7-15 |
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| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
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| Code 128 Code Page | Code 128 Code Page (*2) | 128DCP## | 7-16 |
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| | *On | UPAENA1 | 7-18 |
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| | *On | UPACKX1 | 7-18 |
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| | *On | UPANSX1 | 7-18 |
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| | On | UPAAD21 | 7-19 |
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| | On | UPAAD51 | 7-19 |
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| | Required | UPAARQ1 | 7-19 |
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| | *On | UPAADS1 | 7-19 |

| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
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| UPC-A/EAN-13 with Extended Coupon Code | *Off | CPNENA0 | 7-20 |
| | Allow Concatenation | CPNENA1 | 7-20 |
| | Require Concatenation | CPNENA2 | 7-20 |
| UPC-E0 | Default All UPC-E Settings | UPEDFT | 7-20 |
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| | *On | UPEEN01 | 7-20 |
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| | On | UPEEXP1 | 7-21 |
| UPC-E0 Addenda Required | Required | UPEARQ1 | 7-21 |
| | *Not Required | UPEARQ0 | 7-21 |
| UPC-E0 Addenda Separator | *On | UPEADS1 | 7-21 |
| | Off | UPEADS0 | 7-21 |
| UPC-E0 Check Digit | Off | UPECKX0 | 7-21 |
| | *On | UPECKX1 | 7-21 |
| UPC-E0 Number System | Off | UPENSX0 | 7-22 |
| | *On | UPENSX1 | 7-22 |
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| | *2 Digit Addenda Off | UPEAD20 | 7-22 |
| | 5 Digit Addenda On | UPEAD51 | 7-22 |
| | *5 Digit Addenda Off | UPEAD50 | 7-22 |
| UPC-E1 | *Off | UPEEN10 | 7-22 |
| | On | UPEEN11 | 7-22 |
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| EAN/JAN-13 | Off | E13ENA0 | 7-23 |
| | *On | E13ENA1 | 7-23 |
| EAN/JAN-13 Check Digit | Off | E13CKX0 | 7-23 |
| | *On | E13CKX1 | 7-23 |

| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
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| | *2 Digit Addenda Off | E13AD20 | 7-24 |
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| | *5 Digit Addenda Off | E13AD50 | 7-24 |
| EAN/JAN-13 Addenda Required | *Not Required | E13ARQ0 | 7-24 |
| | Required | E13ARQ1 | 7-24 |
| EAN/JAN-13 Addenda Separator | Off | E13ADS0 | 7-24 |
| | *On | E13ADS1 | 7-24 |
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| | On | E13ISB1 | 7-25 |
| EAN/JAN-8 | Default All EAN/ JAN 8 Settings | EA8DFT | 7-25 |
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| EAN/JAN-8 Addenda | *2 Digit Addenda Off | EA8AD20 | 7-26 |
| | 2 Digit Addenda On | EA8AD21 | 7-26 |
| | *5 Digit Addenda Off | EA8AD50 | 7-26 |
| | 5 Digit Addenda On | EA8AD51 | 7-26 |
| EAN/JAN-8 Addenda Required | *Not Required | EA8ARQ0 | 7-26 |
| | Required | EA8ARQ1 | 7-26 |
| EAN/JAN-8 Addenda Separator | Off | EA8ADS0 | 7-26 |
| | *On | EA8ADS1 | 7-26 |
| MSI | Default All MSI Settings | MSIDFT | 7-27 |
| MSI | *Off | MSIENA0 | 7-27 |
| | On | MSIENA1 | 7-27 |

| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
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| MSI Message Length | Minimum (4 - 48) *4 | MSIMIN## | 7-28 |
| | Maximum (4 - 48) *48 | MSIMAX## | 7-28 |
| Plessey Code | Default All Plessey Settings | PLSDFT | 7-28 |
| Plessey Code | *Off | PLSENA0 | 7-28 |
| | On | PLSENA1 | 7-28 |
| Plessey Message Length | Minimum (4 - 48) *4 | PLSMIN## | 7-28 |
| | Maximum (4 - 48) *48 | PLSMAX## | 7-28 |
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| GS1 DataBar Limited | Default All GS1 DataBar Limited Settings | RSLDFT | 7-29 |
| GS1 DataBar Limited | Off | RSLENA0 | 7-29 |
| | *On | RSLENA1 | 7-29 |
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| | Maximum (4 - 74) *74 | RSEMAX## | 7-30 |
| PosiCode | Default All PosiCode Settings | POSDFT | 7-32 |

| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
|---|---|---|---|
| PosiCode | Off | POSENA0 | 7-31 |
| | *On | POSENA1 | 7-31 |
| | A and B On | POSLIM0 | 7-31 |
| | A and B and Limited A On | POSLIM1 | 7-31 |
| | *A and B and Limited B On | POSLIM2 | 7-31 |
| PosiCode Msg. Length | Minimum (2 - 80) *4 | POSMIN## | 7-31 |
| | Maximum (2 - 80) *48 | POSMAX## | 7-31 |
| Trioptic Code | *Off | TRIENA0 | 7-32 |
| | On | TRIENA1 | 7-32 |
| Codablock F | Default All Codablock F Settings | CBFDFT | 7-32 |
| Codablock F | *Off | CBFENA0 | 7-32 |
| | On | CBFENA1 | 7-32 |
| Codablock F Msg. Length | Minimum (1 - 2048) *1 | CBFMIN#### | 7-32 |
| | Maximum (1 - 2048) *2048 | CBFMAX#### | 7-32 |
| Code 16K | Default All Code 16K Settings | 16KDFT | 7-33 |
| Code 16K | *Off | 16KENA0 | 7-33 |
| | On | 16KENA1 | 7-33 |
| Code 16K Msg. Length | Minimum (0 - 160) *1 | 16KMIN### | 7-33 |
| | Maximum (0 - 160) *160 | 16KMAX### | 7-33 |
| Code 49 | Default All Code 49 Settings | C49DFT | 7-34 |
| Code 49 | Off | C49ENA0 | 7-34 |
| | *On | C49ENA1 | 7-34 |
| Code 49 Msg. Length | Minimum (1 - 81) *1 | C49MIN## | 7-34 |
| | Maximum (1 - 81) *81 | C49MAX## | 7-34 |
| PDF417 | Default All PDF417 Settings | PDFDFT | 7-35 |
| PDF417 | *On | PDFENA1 | 7-35 |
| | Off | PDFENA0 | 7-35 |
| PDF417 Msg. Length | Minimum (1-2750) *1 | PDFMIN | 7-35 |
| | Maximum (1-2750) *2750 | PDFMAX | 7-35 |

| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
|---|---|---|---|
| MicroPDF417 | Default All Micro PDF417 Settings | MPDDFT | 7-36 |
| MicroPDF417 | On | MPDENA1 | 7-36 |
| | *Off | MPDENA0 | 7-36 |
| MicroPDF417 Msg. Length | Minimum (1-366) *1 | MPDMIN | 7-36 |
| | Maximum (1-366) *366 | MPDMAX | 7-36 |
| GS1 Composite Codes | On | COMENA1 | 7-36 |
| | *Off | COMENA0 | 7-36 |
| UPC/EAN Version | On | COMUPC1 | 7-37 |
| | *Off | COMUPC0 | 7-37 |
| GS1 Composite Codes Msg. Length | Minimum (1-2435) *1 | COMMIN | 7-37 |
| | Maximum (1-2435) *2435 | COMMAX | 7-37 |
| GS1 Emulation | *GS1 Emulation Off | EANEMU0 | 7-38 |
| | GS1-128 Emulation | EANEMU1 | 7-38 |
| | GS1 DataBar Emulation | EANEMU2 | 7-38 |
| | GS1 Code Expansion Off | EANEMU3 | 7-38 |
| TCIF Linked Code 39 (TLC39) | On | T39ENA1 | 7-38 |
| | *Off | T39ENA0 | 7-38 |
| 4-CB (4-State Customer Barcode) | On | 4CBENA1 | 7-39 |
| | *Off | 4CBENA0 | 7-39 |
| ID-tag (UPU 4-State) | On | TAGENA1 | 7-39 |
| | *Off | TAGENA0 | 7-39 |
| Postnet | On | NETENA1 | 7-39 |
| | *Off | NETENA0 | 7-39 |
| Postnet Check Digit | Transmit | NETCKX1 | 7-39 |
| | *Don't Transmit | NETCKX0 | 7-39 |
| Planet Code | On | PLNENA1 | 7-39 |
| | *Off | PLNENA0 | 7-40 |

| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
|---|---|---|---|
| Planet Code Check Digit | Transmit | PLNCKX1 | 7-40 |
| | *Don't Transmit | PLNCKX0 | 7-40 |
| British Post | On | BPOENA1 | 7-41 |
| | *Off | BPOENA0 | 7-41 |
| Canadian Post | On | CANENA1 | 7-40 |
| | *Off | CANENA0 | 7-39 |
| Kix (Netherlands) Post | On | KIXENA1 | 7-43 |
| | *Off | KIXENA0 | 7-41 |
| Australian Post | On | AUSENA1 | 7-41 |
| | *Off | AUSENA0 | 7-43 |
| Australian Post Interpretation | *Bar Output | AUSINT0 | 7-42 |
| | Numeric N Table | AUSINT1 | 7-42 |
| | Alphanumeric C Table | AUSINT2 | 7-42 |
| Japanese Post | On | JAPENA1 | 7-41 |
| | *Off | JAPENA0 | 7-41 |
| China Post | Default All China Post Settings | CPCDFT | 7-43 |
| China Post | *Off | CPCENA0 | 7-43 |
| | On | CPCENA1 | 7-43 |
| China Post Msg. Length | Minimum (2 - 80) *4 | CPCMIN## | 7-43 |
| | Maximum (2 - 80) *80 | CPCMAX## | 7-43 |
| Korea Post | Default All Korea Post Settings | KPCDFT | 7-44 |
| Korea Post | *Off | KPCENA0 | 7-44 |
| | On | KPCENA1 | 7-44 |
| Korea Post Msg. Length | Minimum (2 - 80) *4 | KPCMIN## | 7-44 |
| | Maximum (2 - 80) *48 | KPCMAX## | 7-44 |
| QR Code | Default All QR Code Settings | QRCDFT | 7-45 |
| QR Code | *On | QRCENA1 | 7-45 |
| | Off | QRCENA0 | 7-45 |
| QR Code Msg. Length | Minimum (1-7089) *1 | QRCMIN | 7-45 |
| | Maximum (1-7089) *7089 | QRCMAX | 7-45 |

| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
|---|---|---|---|
| Data Matrix | Default All Data Matrix Settings | IDMDFT | 7-46 |
| Data Matrix | *On | IDMENA1 | 7-46 |
| | Off | IDMENA0 | 7-46 |
| Data Matrix Msg. Length | Minimum (1-3116) *1 | IDMMIN | 7-46 |
| | Maximum (1-3116) *3116 | IDMMAX | 7-46 |
| MaxiCode | Default All MaxiCode Settings | MAXDFT | 7-47 |
| MaxiCode | *On | MAXENA1 | 7-47 |
| | Off | MAXENA0 | 7-47 |
| MaxiCode Msg. Length | Minimum (1-150) *1 | MAXMIN | 7-47 |
| | Maximum (1-150) *150 | MAXMAX | 7-47 |
| Aztec Code | Default All Aztec Code Settings | AZTDFT | 7-48 |
| Aztec Code | *On | AZTENA1 | 7-48 |
| | Off | AZTENA0 | 7-48 |
| Aztec Code Msg. Length | Minimum (1-3832) *1 | AZTMIN | 7-48 |
| | Maximum (1-3832) *3832 | AZTMAX | 7-48 |
| Aztec Runes | Enable Runes | AZTRUN1 | 7-48 |
| | *Disable Runes | AZTRUN0 | 7-48 |
| Chinese Sensible (Han Xin) Code | On | HX_ENA1 | 7-49 |
| | *Off | HX_ENA0 | 7-49 |
| Chinese Sensible (Han Xin) Code Msg. Length | Minimum (1-7833) *1 | HX_MIN | 7-49 |
| | Maximum (1-7833) *7833 | HX_MAX | 7-49 |
| Chinese Sensible (Han Xin) Code | Default All Han Xin Code Settings | HX_DFT | 7-49 |

| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
|---|---|---|---|
| ***Imaging Default Commands*** | | | |
| | Default all Imaging Commands | IMGDFT | 8-1 |
| Image Snap | Imaging Style - Decoding | SNPSTY0 | 8-2 |
| | *Imaging Style - Photo | SNPSTY1 | 8-2 |
| | Imaging Style - Manual | SNPSTY2 | 8-2 |
| | Beeper On | SNPBEP1 | 8-2 |
| | *Beeper Off | SNPBEP0 | 8-2 |
| | Exposure (1-7874 microseconds) | SNPEXP | 8-3 |
| | *Gain - None | SNPGAN1 | 8-4 |
| | Gain - Medium | SNPGAN2 | 8-4 |
| | Gain - Heavy | SNPGAN4 | 8-4 |
| | Gain - Maximum | SNPGAN8 | 8-4 |
| | Delta for Acceptance (0-255) *25 | SNPDEL### | 8-4 |
| | *LED State - Off | SNPLED0 | 8-3 |
| | LED State - On | SNPLED1 | 8-3 |
| | *Wait for Trigger Off | SNPTRG0 | 8-2 |
| | Wait for Trigger On | SNPTRG1 | 8-2 |
| | Update Tries (0-10) *6 | SNPTRY## | 8-4 |
| | Target White Value (0-255) *125 | SNPWHT### | 8-4 |
| | Target Set Point Percentage (1-99) *50 | SNPPCT## | 8-5 |
| Image Ship | *Infinity Filter - Off | IMGINF0 | 8-6 |
| | Infinity Filter - On | IMGINF1 | 8-6 |
| | *Compensation Off | IMGCOR0 | 8-6 |
| | Compensation On | IMGCOR1 | 8-6 |
| | *Pixel Depth - 8 bits/pixel (grayscale) | IMGBPP8 | 8-6 |
| | Pixel Depth - 1 bit/pixel (B&W) | IMGBPP1 | 8-6 |
| | *Don’t Sharpen Edges | IMGEDG0 | 8-7 |

| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
|---|---|---|---|
| Image Ship (continued) | Sharpen Edges (0-23) | IMGEDG## | 8-7 |
| | *File Format - JPEG | IMGFMT6 | 8-7 |
| | File Format - KIM | IMGFMT0 | 8-7 |
| | File Format - TIFF binary | IMGFMT1 | 8-7 |
| | File Format - TIFF binary group 4, compressed | IMGFMT2 | 8-7 |
| | File Format - TIFF grayscale | IMGFMT3 | 8-7 |
| | File Format - Uncompressed binary | IMGFMT4 | 8-7 |
| | File Format - Uncompressed grayscale | IMGFMT5 | 8-7 |
| | File Format - BMP | IMGFMT8 | 8-7 |
| | *Histogram Stretch Off | IMGHIS0 | 8-8 |
| | Histogram Stretch On | IMGHIS1 | 8-8 |
| | Invert Image around X axis | IMGNVX1 | 8-8 |
| | Invert Image around Y axis | IMGNVY1 | 8-8 |
| | *Noise Reduction Off | IMGFSP0 | 8-9 |
| | Noise Reduction On | IMGFSP1 | 8-9 |
| | Image as snapped (rightside up) | IMGROT0 | 8-9 |
| | Rotate Image 90° right | IMGROT1 | 8-9 |
| | Rotate Image 180° (upside down) | IMGROT2 | 8-9 |
| | Rotate Image 90° left | IMGROT3 | 8-9 |
| | JPEG Image Quality (0-100) *50 | IMGJQF### | 8-10 |
| | *Gamma Correction Off | IMGGAM0 | 8-10 |
| | Gamma Correction On (1-1000) | IMGGAM### | 8-10 |
| | Image Crop - Left (0-640) *0 | IMGWNL### | 8-10 |
| | Image Crop - Right (0-640) *639 | IMGWNR### | 8-10 |

| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
|---|---|---|---|
| Image Ship (continued) | Image Crop - Top (0-480) *0 | IMGWNT### | 8-10 |
| | Image Crop - Bottom (0-480) *479 | IMGWNB### | 8-11 |
| | Image Crop - Margin (0-238) *0 | IMGMAR### | 8-11 |
| | Protocol - None (raw) | IMGXFR0 | 8-11 |
| | Protocol - None (default USB) | IMGXFR2 | 8-11 |
| | Protocol - Hmodem Compressed | IMGXFR3 | 8-11 |
| | Protocol - Hmodem | IMGXFR4 | 8-11 |
| | Ship Every Pixel | IMGSUB1 | 8-12 |
| | Ship Every 2nd Pixel | IMGSUB2 | 8-12 |
| | Ship Every 3rd Pixel | IMGSUB3 | 8-12 |
| | *Document Image Filter Off | IMGUSH0 | 8-12 |
| | Document Image Filter On (0-255) | IMGUSH### | 8-13 |
| | *Don't Ship Histogram | IMGHST0 | 8-14 |
| | Ship Histogram | IMGHST1 | 8-14 |
| ***OCR Selections*** | | | |
| OCR | Default All OCR Settings | OCRDFT | 9-1 |
| | OCR-A On | OCRENA1 | 9-1 |
| | OCR-B On | OCRENA2 | 9-2 |
| | U.S. Currency On | OCRENA3 | 9-2 |
| | MICR E 13 B On | OCRENA4 | 9-2 |
| | SEMI Font | OCRENA5 | 9-3 |
| | * All OCR Off | OCRENA0 | 9-3 |

| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
|---|---|---|---|
| OCR Check Character | OCR Mod. 10 Check Char. | “OCRCHK01 23456789” | 9-8 |
| | OCR Mod. 36 Check Char. | “OCRCHK01 23456789AB CDEFGHIJKL MNOPQRST UVWXYZ” | 9-8 |
| | OCR User-Defined Check Char. | OCRCHK | 9-9 |
| | 3-1-3-1 Weighted Mod. 10 Check Char. | OCRCHK3-1-3-1 | 9-10 |
| | 2-1-2-1 Weighted Mod. 10 Check Char. | OCRCHK2-1-2-1 | 9-10 |
| OCR Templates | Enter OCR Template | OCRTMP | 9-13 |
| | Enter User-Defined Variable g | OCRGPG | 9-13 |
| | Enter User-Defined Variable h | OCRGPH | 9-13 |

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# Product Specifications

## 4600g and 4600r

| *Parameter* | *Specification* |
|---|---|
| **4600g/4600r Dimensions (Typical):** | |
| Height | 6.2 inches (15.7 cm) |
| Length | 5.3 inches (13.5 cm) |
| Width | 3.2 inches (8.1 cm) |
| Weight | 6.5 ounces (184.3 g) |
| **4600rp Dimensions (Typical):** | |
| Height (Stand and imager) | 8.2 inches (20.8 cm) |
| Length (Stand) | 5.4 inches (13.7 cm) |
| Length (Back edge of stand to front of imager nose with image in upright position) | 6.5 inches (16.5 cm) |
| Width (Stand base) | 3.5 inches (8.9 cm) |
| Weight (Stand and imager) | 14.9 ounces (422 g) |
| Illumination:<br>Scan LEDs<br>Aiming LEDs | <br>617nm ±30nm<br>526nm ±30nm |
| Image | 752x480<br>Binary, TIFF, or JPEG output. |
| Skew Angle | ±40 degrees |
| Pitch Angle | ±40 degrees |
| Motion Tolerance:<br>Streaming Presentation Trigger<br>Other Trigger Selections | <br>20 inches (50 cm) per second<br>4 inches (10 cm) per second |
| Symbol Contrast | Grade 1.0 (20% or greater) |
| Voltage Requirements | 4 - 14 VDC at imager |
| Current Draw (Typical): | Input / Scanning / Standby / Inrush / Low Power<br>5V / 334mA / 80mA / 500mA / 100µA<br>12V / 170mA / 55mA |
| Power Supply Noise Rejection | Maximum 100mV peak to peak, 10 to 100 kHz |
| Temperature Ranges: | |
| Operating | +32°F to +122°F (0°C to +50°C) |
| Storage | -40°F to +140°F (-40°C to +60°C) |
| Humidity | 0 to 95% non-condensing |
| Mechanical Drop | Operational after 50 drops from 6 feet (1.8 m) to concrete |

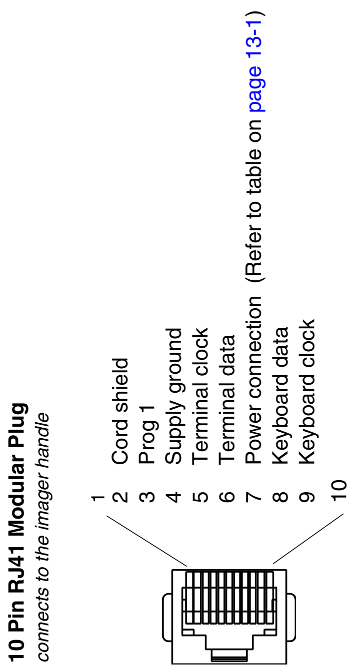
| | |
|---|---|
| Vibration | Withstands 5G peak from 22 to 300 Hz |
| ESD Tolerance | 15 kV to any external surface |

## 4800i

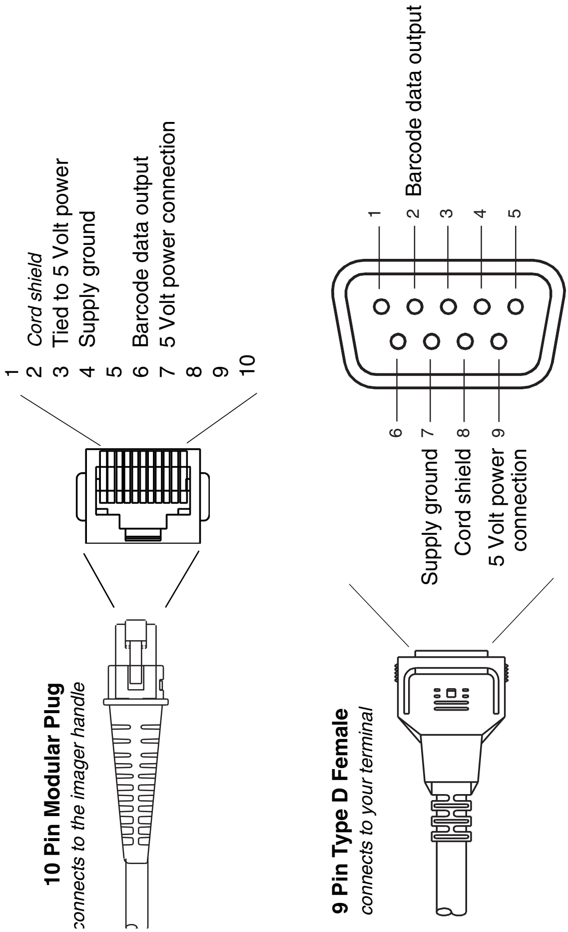
| Parameter | Specification |
|---|---|
| Dimensions (Typical):<br>Height<br>Length<br>Width<br>Weight | <br>6.2 inches (15.7 cm)<br>5.3 inches (13.5 cm)<br>3.2 inches (8.1 cm)<br>6.5 ounces (184.3 g) |
| Illumination:<br>Scan LEDs<br>Aiming LEDs | <br>617nm ±30nm<br>526nm ±30nm |
| Image | 752x480<br>Binary, TIFF, or JPEG output. |
| Skew Angle | ±40 degrees |
| Pitch Angle | ±40 degrees |
| Motion Tolerance:<br>Streaming Presentation Trigger<br>Other Trigger Selections | <br>20 inches (50 cm) per second<br>4 inches (10 cm) per second |
| Symbol Contrast | Grade 1.0 (20% or greater) |
| Voltage Requirements | 4 - 14 VDC at imager |
| Current Draw (Typical): | Input / Scanning / Standby / Inrush / Low Power<br>5V / 334mA / 80mA / 500mA / 100µA<br>12V / 170mA / 55mA |
| Power Supply Noise Rejection | Maximum 100mV peak to peak, 10 to 100 kHz |
| Temperature Ranges:<br>Operating<br>Storage | <br>+14°F to +122°F (-10°C to +50°C)<br>-40°F to +158°F (-40°C to +70°C) |
| Humidity | 0 to 95% non-condensing |
| Mechanical Drop | Operational after 50 drops from 6.5 feet (2 m) to concrete at 10°C |
| Vibration | Withstands 5G peak from 22 to 300 Hz |
| ESD Tolerance | 15 kV to any external surface |

# Standard Cable Pinouts

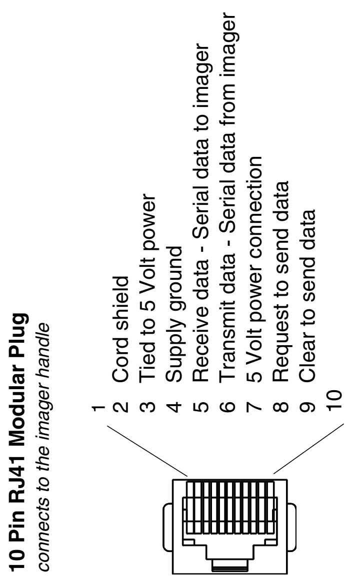
## Keyboard Wedge



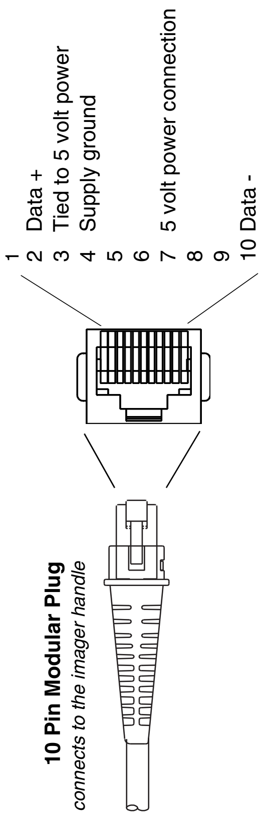
## *Wand Emulation*



## *Serial Output*



## *USB*



1
2 Data +
3 Tied to 5 volt power
4 Supply ground
5
6
7 5 volt power connection
8
9
10 Data -
**10 Pin Modular Plug**
*connects to the imager handle*

# 14 Maintenance

## Repairs

Repairs and/or upgrades are not to be performed on this product. These services are to be performed only by an authorized service center. See "Customer Support" on page 15-1 for further information.

## Maintenance

Your imager provides reliable and efficient operation with a minimum of care. Although specific maintenance is not required, the following periodic checks ensure dependable imager operation:

### Cleaning the Device

Reading performance may degrade if the imager's window is not clean. If the window is visibly dirty, or if the imager isn't operating well, clean the window with a soft cloth or lens tissue dampened with water (or a mild detergent- water solution). If a detergent solution is used, rinse with a clean lens tissue dampened with water only.

The imager's housing may also be cleaned the same way.

**⚠ Caution:**

**Do not submerge the imager in water. Do not use abrasive wipes or tissues on the imager's window – abrasive wipes may scratch the window.**

**Never use solvents (e.g., acetone, benzene, ether, or phenol-based agents) on the housing or window – solvents may damage the finish or the window.**

### Inspecting Cords and Connectors

Inspect the imager's interface cable and connector for wear or other signs of damage. A badly worn cable or damaged connector may interfere with imager operation. Contact your Honeywell distributor for information about cable replacement. Cable replacement instructions are on page 14-2.

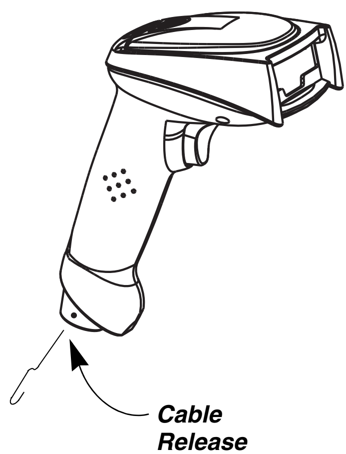
## *Replacing the Interface Cable*

The standard interface cable is attached to the imager with an 10-pin modular connector. When properly seated, the connector is held in the imager's handle by a flexible retention tab. The interface cable is designed to be field replaceable.

- Order replacement cables from Honeywell or from an authorized distributor.
- When ordering a replacement cable, specify the cable part number of the original interface cable.

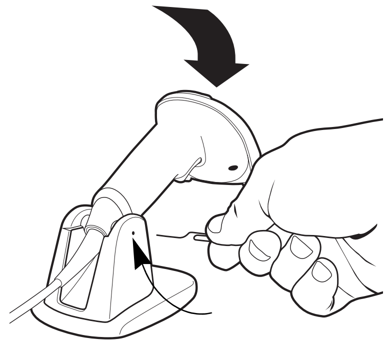
### *To Replace the 4600g/4600r Interface Cable:*

1. Turn the power to the host system OFF.
2. Disconnect the imager's cable from the terminal or computer.
3. Locate the small hole on the side of the imager's handle. This is the cable release.
4. Straighten one end of a paper clip.
5. Insert the end of the paper clip into the small hole and press in. This depresses the retention tab, releasing the connector. Pull the connector out while maintaining pressure on the paper clip, then remove the paper clip.



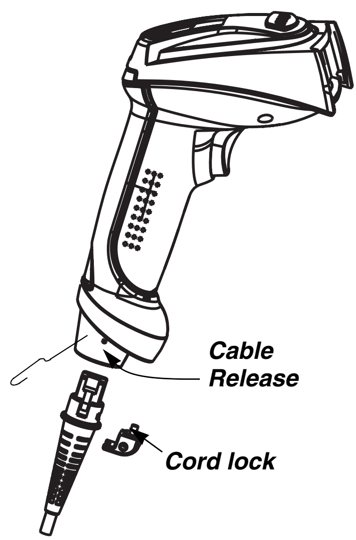

6. Replace with the new cable. Insert the connector into the opening and press firmly. The connector is keyed to go in only one way, and will click into place.

### *To Replace the 4600rp Interface Cable:*



1. Turn the power to the host system OFF.
2. Disconnect the imager's cable from the terminal or computer.
3. Rotate the imager downward to the last position.
4. Locate the small hole on the side of the stand. This is the cable release.
5. Straighten one end of a paper clip.
6. Insert the end of the paper clip into the small hole and press in. This depresses the retention tab, releasing the connector. Pull the connector out while maintaining pressure on the paper clip, then remove the paper clip.
7. Replace with the new cable. Insert the connector into the opening and press firmly. The connector is keyed to go in only one way, and will click into place.

### *To Replace the 4800i Interface Cable:*




1. Turn the power to the host system OFF.
2. Disconnect the imager's cable from the terminal or computer.
3. Use a screwdriver to unscrew the cord lock from the base of the imager.
4. Locate the small hole on the side of the imager's handle. This is the cable release.
5. Straighten one end of a paper clip.
6. Insert the end of the paper clip into the small hole and press in. This depresses the retention tab, releasing the connector. Pull the connector out while maintaining pressure on the paper clip, then remove the paper clip.
7. Replace with the new cable. Insert the connector into the opening and press firmly. The connector is keyed to go in only one way, and will click into place.

8. Screw the cord lock back in place over the cord.

## Troubleshooting

The imager automatically performs self-tests whenever you turn it on. If your imager is not functioning properly, review the following Troubleshooting Guide to try to isolate the problem.

*Is the power on? Is the aiming beam on?*

If the aiming beam isn't illuminated, check that:

- The cable is connected properly.
- The host system power is on (if external power isn't used).
- The trigger works.

*Is the imager having trouble reading your symbols?*

If the imager isn't reading symbols well, check that the symbols:

- Aren't smeared, rough, scratched, or exhibiting voids.
- Aren't coated with frost or water droplets on the surface.
- Are enabled in the imager or in the decoder to which the imager connects.

*Is the barcode displayed but not entered?*

The barcode is displayed on the host device correctly, but you still have to press a key to enter it (the Enter/Return key or the Tab key, for example).

You need to program a suffix. Programming a suffix enables the imager to output the barcode data plus the key you need (such as "CR") to enter the data into your application. Refer to "Prefix/Suffix Overview" on page 4-1 for further information.

*Does the imager read the barcode incorrectly?*

If the imager reads a barcode, but the data is not displayed correctly on the host screen:

- The imager may not be programmed for the appropriate terminal interface. For example, you scan "12345" and the host displays "@es%."

  Reprogram the imager with the correct Plug and Play or Terminal selection barcode. See Chapter 1 and Chapter 2.
- The imager may not be programmed to output your barcode data properly. For example, you scan "12345" and the host displays "A12345B."

  Reprogram the imager with the proper symbology selections. See Chapter 7.

*The imager won't read your barcode at all.*

1. Scan the sample barcodes in the back of this manual. If the imager reads the sample barcodes, check that your barcode is readable.
   Verify that your barcode symbology is enabled (see Chapter 7).

2. If the imager still can't read the sample barcodes, scan "All Symbologies" on page 7-2.

If you aren't sure what programming options have been set in the imager, or if you want the factory default settings restored, scan Standard Product Default Settings on page 12-4.

# 15 Customer Support

## Technical Assistance

If you need assistance installing or troubleshooting your device, please call your distributor or the nearest technical support office:

**North America/Canada**

Telephone:  (800) 782-4263
Fax number:  (315) 554-6705
*E-mail:  natechsupport@honeywell.com*

**Latin America**

Telephone:  (803) 835-8000
Telephone:  (800) 782-4263
*E-mail:  latechsupport@honeywell.com*

**Brazil**

Telephone: +55 (21) 3535-9100
Fax:  +55 (21) 3535-9105
*E-mail:  brsuporte@honeywell.com*

**Mexico**

Telephone:  (803) 835-8000
*E-mail:  latechsupport@honeywell.com*

**Europe, Middle East, and Africa**

Telephone:  +31 (0) 40 7999 393
Fax:  +31 (0) 40 2425 672
*E-mail:  eurosupport@honeywell.com*

**Asia Pacific**

Telephone - Hong Kong:  +852-3188-3485 or  2511-3050
Telephone - China:  +86 21 6361 3818
*E-mail:  aptechsupport@honeywell.com*

**Japan**

Telephone:  +813 5770-6312
*E-mail:  aptechsupport@honeywell.com*

**Malaysia**

Telephone: +603-6201-7020
*E-mail:  aptechsupport@honeywell.com*

### Online Technical Assistance

You can also access technical assistance online at www.honeywell.com/aidc.

# *Product Service and Repair*

Honeywell International Inc. provides service for all its products through service centers throughout the world. To obtain warranty or non-warranty service, contact the appropriate location below to obtain a Return Material Authorization number (RMA #) before returning the product.

**North America**

Telephone: (800) 782-4263
Fax: (803) 835-8012
*E-mail: naservice@honeywell.com*

**Latin America**

Telephone: (803) 835-8000
Telephone: (800) 782-4263
Fax: (239) 263-9689
*E-mail: laservice@honeywell.com*

**Brazil**

Telephone: +55 (21) 3535-9100
Fax: +55 (21) 3535-9105
*E-mail: brservice@honeywell.com*

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## *Online Product Service and Repair Assistance*

You can also access product service and repair assistance online at www.honeywell.com/aidc.

## Limited Warranty

Honeywell International Inc. ("HII") warrants its products to be free from defects in materials and workmanship and to conform to HII's published specifications applicable to the products purchased at the time of shipment. This warranty does not cover any HII product which is (i) improperly installed or used; (ii) damaged by accident or negligence, including failure to follow the proper maintenance, service, and cleaning schedule; or (iii) damaged as a result of (A) modification or alteration by the purchaser or other party, (B) excessive voltage or current supplied to or drawn from the interface connections, (C) static electricity or electro-static discharge, (D) operation under conditions beyond the specified operating parameters, or (E) repair or service of the product by anyone other than HII or its authorized representatives.

This warranty shall extend from the time of shipment for the duration published by HII for the product at the time of purchase ("Warranty Period"). Any defective product must be returned (at purchaser's expense) during the Warranty Period to HII factory or authorized service center for inspection. No product will be accepted by HII without a Return Materials Authorization, which may be obtained by contacting HII. In the event that the product is returned to HII or its authorized service center within the Warranty Period and HII determines to its satisfaction that the product is defective due to defects in materials or workmanship, HII, at its sole option, will either repair or replace the product without charge, except for return shipping to HII.

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All provisions of this Limited Warranty are separate and severable, which means that if any provision is held invalid and unenforceable, such determination shall not affect the validity of enforceability of the other provisions hereof. Use of any peripherals not provided by the manufacturer may result in damage not covered

by this warranty. This includes but is not limited to: cables, power supplies, cradles, and docking stations. HII extends these warranties only to the first end-users of the products. These warranties are non-transferable.

The duration of the limited warranty for the 4600g, 4600r, 4600rp, or 4800i is for five (5) year(s).

# A Reference Charts

## Symbology Chart

| Symbology | AIM ID | Possible AIM ID Modifiers (*m*) | Code ID (hex) |
|---|---|---|---|
| *All Symbologies* | | | (0x99) |
| Australian Post | ]X0 | | A (0x41) |
| Aztec Code | ]z*m* | 0-9, A-C | z (0x7A) |
| British Post | ]X0 | | B (0x42) |
| Canadian Post | ]X0 | | C (0x43) |
| China Post | ]X0 | | Q (0x51) |
| Chinese Sensible Code (Han Xin Code) | ]X0 | | H (0x48) |
| Codabar | ]F*m* | 0-1 | a (0x61) |
| Codablock F | ]O*m* | 0, 1, 4, 5, 6 | q (0x71) |
| Code 11 | ]H3 | | h (0x68) |
| Code 128 | ]C*m* | 0, 1, 2, 4 | j (0x6A) |
| Code 16K | ]K*m* | 0, 1, 2, 4 | o (0x6F) |
| Code 32 Pharmaceutical (PARAF) | ]X0 | | < (0x3C) |
| Code 39 (supports Full ASCII mode) | ]A*m* | 0, 1, 3, 4, 5, 7 | b (0x62) |
| Code 49 | ]T*m* | 0, 1, 2, 4 | l (0x6C) |
| Code 93 and 93i | ]G*m* | 0-9, A-Z, a-m | i (0x69) |
| Data Matrix | ]d*m* | 0-6 | w (0x77) |
| EAN-13 (including Bookland EAN) | ]E0 | | d (0x64) |
| EAN-13 with Add-On | ]E3 | | d (0x64) |
| EAN-13 with Extended Coupon Code | ]E3 | | d (0x64) |
| EAN-8 | ]E4 | | D (0x44) |
| EAN-8 with Add-On | ]E3 | | D (0x44) |
| GS1 Composite | ]e*m* | 0-3 | y (0x79) |
| GS1 DataBar | ]e*m* | 0 | y (0x79) |
| GS1-128 | ]C1 | | I (0x49) |
| ID-tag (UPU 4-State) | ]X0 | | N (0x4E) |

| Symbology | AIM ID | Possible AIM ID Modifiers (*m*) | Code ID (hex) |
|---|---|---|---|
| Intelligent Mail Barcode | ]X0 | | M (0x4D) |
| Interleaved 2 of 5 | ]I*m* | 0, 1, 3 | e (0x65) |
| Japanese Post | ]X0 | | J (0x4A) |
| KIX (Netherlands) Post | ]X0 | | K (0x4B) |
| Korea Post | ]X0 | | ? (0x3F) |
| Matrix 2 of 5 | ]X0 | | m (0x6D) |
| MaxiCode | ]U*m* | 0-3 | x (0x7 8) |
| MicroPDF417 | ]L*m* | 3-5 | R (0x52) |
| MSI | ]M*m* | 0 | g (0x67) |
| OCR MICR (E 13 B) | ]o3 | | O (0x4F) |
| OCR SEMI Font | ]o3 | | O (0x4F) |
| OCR US Money Font | ]o3 | | O (0x4F) |
| OCR-A | ]o1 | | O (0x4F) |
| OCR-B | ]o2 | | O (0x4F) |
| PDF417 | ]L*m* | 0-2 | r (0x72) |
| Planet Code | ]X0 | | L (0x4C) |
| Plessey Code | ]P0 | | n (0x6E) |
| Postnet | ]X0 | | P (0x50) |
| QR Code and Micro QR Code | ]Q*m* | 0-6 | s (0x73) |
| Straight 2 of 5 IATA | ]R*m* | 0, 1, 3 | f (0x66) |
| Straight 2 of 5 Industrial | ]S0 | | f (0x66) |
| TCIF Linked Code 39 (TLC39) | ]L2 | | T (0x54) |
| UPC-A | ]E0 | | c (0x63) |
| UPC-A with Add-On | ]E3 | | c (0x63) |
| UPC-A with Extended Coupon Code | ]E3 | | c (0x63) |
| UPC-E | ]E0 | | E (0x45) |
| UPC-E with Add-On | ]E3 | | E (0x45) |
| UPC-E1 (obsolete) | ]X0 | | E (0x45) |

*Note: "m" represents the AIM modifier character. Refer to International Technical Specification, Symbology Identifiers, for AIM modifier character details.*

*Note: Prefix/Suffix entries for specific symbologies override the universal (All Symbologies, 99) entry.*

Refer to Data Editing beginning on page 4-1 and Data Formatting beginning on page 5-1 for information about using Code ID and AIM ID.

# *ASCII Conversion Chart (Code Page 1252)*

Note: *This table applies to U.S. style keyboards. Certain characters may differ depending on your Country Code/PC regional settings.*

| Dec | Hex | Char | Dec | Hex | Char | Dec | Hex | Char | Dec | Hex | Char |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 00 | NUL | 32 | 20 | | 64 | 40 | @ | 96 | 60 | ‘ |
| 1 | 01 | SOH | 33 | 21 | ! | 65 | 41 | A | 97 | 61 | a |
| 2 | 02 | STX | 34 | 22 | “ | 66 | 42 | B | 98 | 62 | b |
| 3 | 03 | ETX | 35 | 23 | # | 67 | 43 | C | 99 | 63 | c |
| 4 | 04 | EOT | 36 | 24 | $ | 68 | 44 | D | 100 | 64 | d |
| 5 | 05 | ENQ | 37 | 25 | % | 69 | 45 | E | 101 | 65 | e |
| 6 | 06 | ACK | 38 | 26 | & | 70 | 46 | F | 102 | 66 | f |
| 7 | 07 | BEL | 39 | 27 | ‘ | 71 | 47 | G | 103 | 67 | g |
| 8 | 08 | BS | 40 | 28 | ( | 72 | 48 | H | 104 | 68 | h |
| 9 | 09 | HT | 41 | 29 | ) | 73 | 49 | I | 105 | 69 | i |
| 10 | 0A | LF | 42 | 2A | * | 74 | 4A | J | 106 | 6A | j |
| 11 | 0B | VT | 43 | 2B | + | 75 | 4B | K | 107 | 6B | k |
| 12 | 0C | FF | 44 | 2C | , | 76 | 4C | L | 108 | 6C | l |
| 13 | 0D | CR | 45 | 2D | - | 77 | 4D | M | 109 | 6D | m |
| 14 | 0E | SO | 46 | 2E | . | 78 | 4E | N | 110 | 6E | n |
| 15 | 0F | SI | 47 | 2F | / | 79 | 4F | O | 111 | 6F | o |
| 16 | 10 | DLE | 48 | 30 | 0 | 80 | 50 | P | 112 | 70 | p |
| 17 | 11 | DC1 | 49 | 31 | 1 | 81 | 51 | Q | 113 | 71 | q |
| 18 | 12 | DC2 | 50 | 32 | 2 | 82 | 52 | R | 114 | 72 | r |
| 19 | 13 | DC3 | 51 | 33 | 3 | 83 | 53 | S | 115 | 73 | s |
| 20 | 14 | DC4 | 52 | 34 | 4 | 84 | 54 | T | 116 | 74 | t |
| 21 | 15 | NAK | 53 | 35 | 5 | 85 | 55 | U | 117 | 75 | u |
| 22 | 16 | SYN | 54 | 36 | 6 | 86 | 56 | V | 118 | 76 | v |
| 23 | 17 | ETB | 55 | 37 | 7 | 87 | 57 | W | 119 | 77 | w |
| 24 | 18 | CAN | 56 | 38 | 8 | 88 | 58 | X | 120 | 78 | x |
| 25 | 19 | EM | 57 | 39 | 9 | 89 | 59 | Y | 121 | 79 | y |
| 26 | 1A | SUB | 58 | 3A | : | 90 | 5A | Z | 122 | 7A | z |
| 27 | 1B | ESC | 59 | 3B | ; | 91 | 5B | [ | 123 | 7B | { |
| 28 | 1C | FS | 60 | 3C | < | 92 | 5C | \ | 124 | 7C | \| |
| 29 | 1D | GS | 61 | 3D | = | 93 | 5D | ] | 125 | 7D | } |
| 30 | 1E | RS | 62 | 3E | > | 94 | 5E | ^ | 126 | 7E | ~ |
| 31 | 1F | US | 63 | 3F | ? | 95 | 5F | _ | 127 | 7F | |

| Dec | Hex | Char | Dec | Hex | Char | Dec | Hex | Char | Dec | Hex | Char |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 128 | 80 | € | 160 | A0 |  | 192 | C0 | À | 224 | E0 | à |
| 129 | 81 | □ | 161 | A1 | ¡ | 193 | C1 | Á | 225 | E1 | á |
| 130 | 82 | ‚ | 162 | A2 | ¢ | 194 | C2 | Â | 226 | E2 | â |
| 131 | 83 | ƒ | 163 | A3 | £ | 195 | C3 | Ã | 227 | E3 | ã |
| 132 | 84 | „ | 164 | A4 | ¤ | 196 | C4 | Ä | 228 | E4 | ä |
| 133 | 85 | … | 165 | A5 | ¥ | 197 | C5 | Å | 229 | E5 | å |
| 134 | 86 | † | 166 | A6 | ¦ | 198 | C6 | Æ | 230 | E6 | æ |
| 135 | 87 | ‡ | 167 | A7 | § | 199 | C7 | Ç | 231 | E7 | ç |
| 136 | 88 | ˆ | 168 | A8 | ¨ | 200 | C8 | È | 232 | E8 | è |
| 137 | 89 | ‰ | 169 | A9 | © | 201 | C9 | É | 233 | E9 | é |
| 138 | 8A | Š | 170 | AA | ª | 202 | CA | Ê | 234 | EA | ê |
| 139 | 8B | ‹ | 171 | AB | « | 203 | CB | Ë | 235 | EB | ë |
| 140 | 8C | Œ | 172 | AC | ¬ | 204 | CC | Ì | 236 | EC | ì |
| 141 | 8D | □ | 173 | AD | - | 205 | CD | Í | 237 | ED | í |
| 142 | 8E | Ž | 174 | AE | ® | 206 | CE | Î | 238 | EE | î |
| 143 | 8F | □ | 175 | AF | ¯ | 207 | CF | Ï | 239 | EF | ï |
| 144 | 90 | □ | 176 | B0 | ° | 208 | D0 | Ð | 240 | F0 | ð |
| 145 | 91 | ‘ | 177 | B1 | ± | 209 | D1 | Ñ | 241 | F1 | ñ |
| 146 | 92 | ’ | 178 | B2 | ² | 210 | D2 | Ò | 242 | F2 | ò |
| 147 | 93 | “ | 179 | B3 | ³ | 211 | D3 | Ó | 243 | F3 | ó |
| 148 | 94 | ” | 180 | B4 | ´ | 212 | D4 | Ô | 244 | F4 | ô |
| 149 | 95 | • | 181 | B5 | µ | 213 | D5 | Õ | 245 | F5 | õ |
| 150 | 96 | – | 182 | B6 | ¶ | 214 | D6 | Ö | 246 | F6 | ö |
| 151 | 97 | — | 183 | B7 | · | 215 | D7 | × | 247 | F7 | ÷ |
| 152 | 98 | ˜ | 184 | B8 | ¸ | 216 | D8 | Ø | 248 | F8 | ø |
| 153 | 99 | ™ | 185 | B9 | ¹ | 217 | D9 | Ù | 249 | F9 | ù |
| 154 | 9A | š | 186 | BA | º | 218 | DA | Ú | 250 | FA | ú |
| 155 | 9B | › | 187 | BB | » | 219 | DB | Û | 251 | FB | û |
| 156 | 9C | œ | 188 | BC | ¼ | 220 | DC | Ü | 252 | FC | ü |
| 157 | 9D | □ | 189 | BD | ½ | 221 | DD | Ý | 253 | FD | ý |
| 158 | 9E | ž | 190 | BE | ¾ | 222 | DE | Þ | 254 | FE | þ |
| 159 | 9F | Ÿ | 191 | BF | ¿ | 223 | DF | ß | 255 | FF | ÿ |

## *Code Page Mapping of Printed Barcodes*

Code pages define the mapping of character codes to characters. If the data received does not display with the proper characters, it may be because the barcode being scanned was created using a code page that is different from the one the host program is expecting. If this is the case, select the code page with which the barcodes were created. The data characters should then appear properly.

*Note: The Code Page option is available for Code 39, Code 93, and Code 128.*

| **Code Page** | **Standard** | **Description** |
|---|---|---|
| 1 | CP ISO646 | |
| 2 (Default) | ISO 2022 | Automatic National Replacement Characters |
| 3 | CP Binary | |
| 82 | ISO 2022 11 Swe | Swedish Replacement Characters |
| 83 | ISO 2022 69 Fra | French/Belgian Replacement Characters |
| 81 | ISO 2022 25 Fra | French/Belgian Replacement Characters |
| 84 | ISO 2022 11 Ger | German Replacement Characters |
| 85 | ISO 2022 11 Ita | Italian Replacement Characters |
| 86 | ISO 2022 11 Swi | Swiss Replacement Characters |
| 87 | ISO 2022 11 UK | British Replacement Characters |
| 88 | ISO 2022 11 Dan | Danish Replacement Characters |
| 89 | ISO 2022 11 Nor | Norwegian Replacement Characters |
| 90 | ISO 2022 11 Spa | Spanish Replacement Characters |

# *Sample Symbols*

**UPC-A**

0 123456 7890

**Interleaved 2 of 5**

1234567890

**Code 128**

Code 128

**EAN-13**

9 780330 290951

**Code 39**

BC321

**Codabar**

A13579B

**Code 93**

123456-9$

**Straight 2 of 5 Industrial**

123456

# Sample Symbols

**Matrix 2 of 5**

6543210

**PDF417**

Car Registration

**Code 49**

1234567890

**QR Code**

Numbers

**GS1 DataBar**

(01)00123456789012

**Postnet**

Zip Code

**Data Matrix**

Test Symbol

**4-CB (4-State Customer Barcode)**

01,234,567094,987654321,01234567891

**ID-tag (UPU 4-State)**

J18CUSA8E6N062315014880T

# Sample Symbols

**Aztec**

Package Label

**Micro PDF417**

Test Message

**MaxiCode**

Test Message

**OCR-B with Modulo 10 check character**

5324277

**OCR-A with Modulo 36 check character**

532427D

# OCR Programming Chart

a

c

d

e

g

h

l

r

t

# OCR Programming Chart

T

O

A

D

Discard

Save

# Programming Chart

A

B

C

D

E

F

0

1

2

3

# Programming Chart

4

5

6

7

8

9

Save

Discard

*Note: If you make an error while scanning the letters or digits (before scanning Save), scan Discard, scan the correct letters or digits, and* **Save** *again.*

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2/09